

Kilnwood Vale - Waste Recovery Environmental Permit: Environmental Setting and Site Design EPR/FB3704GH/A001



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1 Introduction

1.1 Background

ESI Ltd (ESI) has been instructed by Dunton Environmental Ltd (Dunton Environmental), the Operator, to act as its Agent in the preparation of a bespoke Environmental Permit application seeking appropriate consent from the Environment Agency (EA) to allow the treatment of in-situ soil with waste, as a waste recovery activity in Phase 2 of Kilnwood Vale, west of Crawley, West Sussex (the Site). The Kilnwood Vale development extends over a total of 3 Phases (the Development). Phase 1 is completed with Phase 2.1 and Phase 2.2A currently under construction.

The waste to be used will be Cement Kiln Dust (CKD), which will replace the use of lime in moisture conditioning of the in-situ soils, in order to achieve the engineering properties necessary for the Development platform on behalf of the Developer (Crest Strategic Projects).

1.2 Planning Permission

Dunton Environmental has been instructed by the Developer to construct a Development platform at the Site. Dunton Environmental is seeking to use CKD as an alternative to lime. CKD is a waste product from the manufacture of cement.

The Site construction is a major strategic development in the south-east of England including c.2,500 dwellings, schools, transport infrastructure, amenity facilities, and employment development. The Development has been the subject of three separate planning permissions issued by Horsham District Council. Table 1.1 provides a summary of the planning permission history, copies of which are appended to the Waste Recovery Plan (WRP) (Appendix B). It should be noted that planning permissions DC/15/2813 is a variation of DC/10/1612 with variations to Conditions 3, 4, 7, 8, 9 and 10 in DC/15/2813.

Table 1.1 Planning permission summary

Reference no.	Date	Comment
DC/10/1612	17 October 2011	Part A: Outline approval for development of approximately 2,500 dwellings, new access from A426, secondary access to A246, neighbourhood centre, pumping station, land for primary school and nursery, land for employment, new rail station, energy centre and amenity space. Part B: Engineering operational associated with landfill remediation and associated infrastructure including pumping station.
DC/13/1437	14 February 2014	Engineering operations associated with landfill remediation and associated infrastructure including pumping station.
DC/15/2813	28 April 2016	Variation of Conditions 3,4,7,8,9,10 of DC/10/1612. This permission supersedes DC/10/1612 Part B and appears to also supersede DC/13/1437

1.3 Report Context

This section of the Environmental Permit application corresponds to Question 1, Appendix 4 of Part B4 (Version 9, January 2017) of the application forms, which requires the provision of an Environmental Setting and Site Design (ESSD) report. This application has been prepared with full reference to prevailing EA guidance, including, but not limited to; EA (2013a); EA (2016a) and EA (2016b).

The aim of this report is to describe the regulated facility in relation to the environmental setting, identifying the source terms, pathways and receptors that will be used as the basis for the risk assessments and reports which accompany this application. Table 1.2 provides a summary of these reports, which will contain more detailed risk assessments.

Table 1.2 Supporting documents and figures

Reference	Title	Description
Documents		
66444R1	Hydrogeological Risk Assessment	Appended to Environmental Risk Assessment. Considers the risks to controlled waters.
66444R2	Waste Recovery Plan	Document, approved by the EA, outlines the proposed deposit of waste for recovery operation
66444R3	Non-Technical Summary	A summary of the proposed activities using non-technical language.
66444R5	Environmental Risk Assessment	Considers the source, pathway, receptor linkages associated with the Site.
66444R6	Operating Techniques	Details of proposed site operations, process locations and technically competent management.
66444R7	Waste Acceptance Procedure	Appended to Operating Techniques report Details the procedure to be followed to accept the CKD to Site.
Figures		
66444D1	Site Location	
66444D2	Sensitive Receptors	
66444D3	Permit boundary	
11950-SK07 SK Rev.06	Cut/fill levels	

1.4 Waste Recovery Plan

A WRP was prepared by ESI and submitted to the EA to seek determination as to whether the proposed activity could be considered a waste recovery operation.

The WRP demonstrates that the waste (CKD) directly replaces non-waste (lime). The EA confirmed that it considered the proposed activity to be a waste recovery operation on 04 January 2018. A copy of the EA's Recovery vs Disposal (RvD) decision is provided as Appendix A. A copy of the Approved WRP (ESI report reference 66444R2), is provided in Appendix B. Since the approval of the

WRP, the only change to the proposals is a reduction of the area to be permitted, based on progress of the Development, using lime.

1.5 Pre-Application Discussions

Pre-application discussions were held with the EA, during determination of the RvD opinion.

These discussions agreed the following:

- The waste operation would be regulated as a bespoke permit covering both a waste recovery operation and a waste treatment operation under the R5 recovery code (recycling/reclamation of other inorganic materials).
- That given the non-hazardous nature of the CKD, the completion of WAMITAB course MROC1 (Level 4 Medium Risk Operator Competence for Non-Hazardous Waste Treatment and Transfer) will provide appropriate Technically Competent Management (TCM) for the Site.

The RvD opinion also provided a list of items, which should be considered in the permit application.

You need to demonstrate that the work would go ahead with non-waste if waste were not available. If you are relying on a statutory obligation under a Section 106 agreement please confirm with references that the agreement covers all areas proposed to be included within the treatment and recovery area.

The WRP demonstrates that the CKD directly replaces a non-waste material (lime). The Development platform at Kilnwood Vale is currently being progressed with the use of lime. The use of CKD instead, frees up the lime for use in higher end uses. This demonstrates, not only that the project would go-ahead using non-waste, but that it already is.

The application does not rely upon Section 106 (S106) agreements to demonstrate obligation, however a number of S106 agreements exist for the Development, which require the Developer to deliver the stipulated aspects of the Development. In order to keep the tight schedule of works, and deliver those obligations, soil moisture conditioning with lime or CKD must take place. Should a permit for the use of CKD not be approved, the Development would continue using lime, which is a valuable natural resource.

You need to outline in detail the volume of soil that requires treating and evidence that there is a clear benefit for undertaking the works. This will inform whether the minimum amount of waste is being used and the proposal can be considered recovery. Where this is not possible you must provide a robust methodology showing how mixing ratios will be assessed on site and how the application of waste will be controlled to meet the agreed engineering standards whilst using the minimum amount of waste necessary.

The response to the preceding request is included in Section 2.4.1.

You need to show what affect the application of waste CKD will have on the receiving subsoil and the quality of that material prior to treatment, which should be inert sub soil. This is to ensure that resulting mixture will not pose a risk to groundwater and surface waters.

With regards to the landfill which underlies the site a detailed hydrogeological risk assessment should be submitted to support any application to address the potential risk of the proposed activity to the underlying waste mass. This should include (but not limited to) inwaste characterisation, hydrological risk assessment, proposals for gas and groundwater

quality monitoring wells and details of ongoing monitoring to be undertaken on the site boundary during the lifetime of the permit.

The response to the preceding request is included in the HRA, (ESI report reference 66444R1), which accompanies this application. The in-situ soil material will be treated with CKD in order to improve the moisture content for engineering purposes. The replacement to be carried out for the Development will involve placement to achieve a low permeability (of no greater than 1×10^{-7} m/s). The low permeability will ensure minimal contact of the in-situ soil materials with any surface or perched groundwater. It will also serve to reduce surface water infiltration through to the underlying, historically placed wastes associated with Holmbush Landfill. This will reduce the leaching potential to perched groundwater and surface water and improve the overall risk to controlled waster at the Site.

Proposed environmental monitoring is discussed in Sections 4 and 4.2.

You must include full details on how you will characterise the waste CKD brought to site. This must include a description of each of the waste suppliers and sufficient information to satisfy the Environment Agency that the material is non-hazardous. The waste acceptance criteria, on site testing and waste management procedures must also be sufficient to deal with the material brought to site and the risk to the surrounding environment.

The CKD to be imported to the Site will be provided predominately from single-source providers. Each source will be subject to appropriate testing to confirm it is non-hazardous due to the potential corrosive nature of the typically high pH material.

On-Site testing will confirm the moisture content of the receiving in-situ material. Appropriate dosing of CKD will be calculated based on this moisture content, applied, mixed in using a rotavator (or similar) and compacted to the target, low permeability specification (1×10^{-7} m/s), as detailed in the Earthworks Specification.

CKD which is classed as hazardous, will not be accepted to the Site. CKD to be accepted to the Site will be non-hazardous. The non-hazardous nature has been determined by the in-vitro test undertaken, and submitted to the EA as part of the WRP, which proves that the CKD is non-corrosive to the skin.

2 Source term characterisation

2.1 Site Location

The Development is situated off the A264 (Crawley Road), approximately 2 km west of Crawley, West Sussex. The entire Development area covers approximately 140 ha. The areas which are the subject of this WRP comprise Phases 2.4 to Phase 2.6 (the Site), cover approximately 32 ha, (Figure 2.1). Phases excluded from the permit boundary have been completed using non-waste (lime).

Figure 2.1 Site location

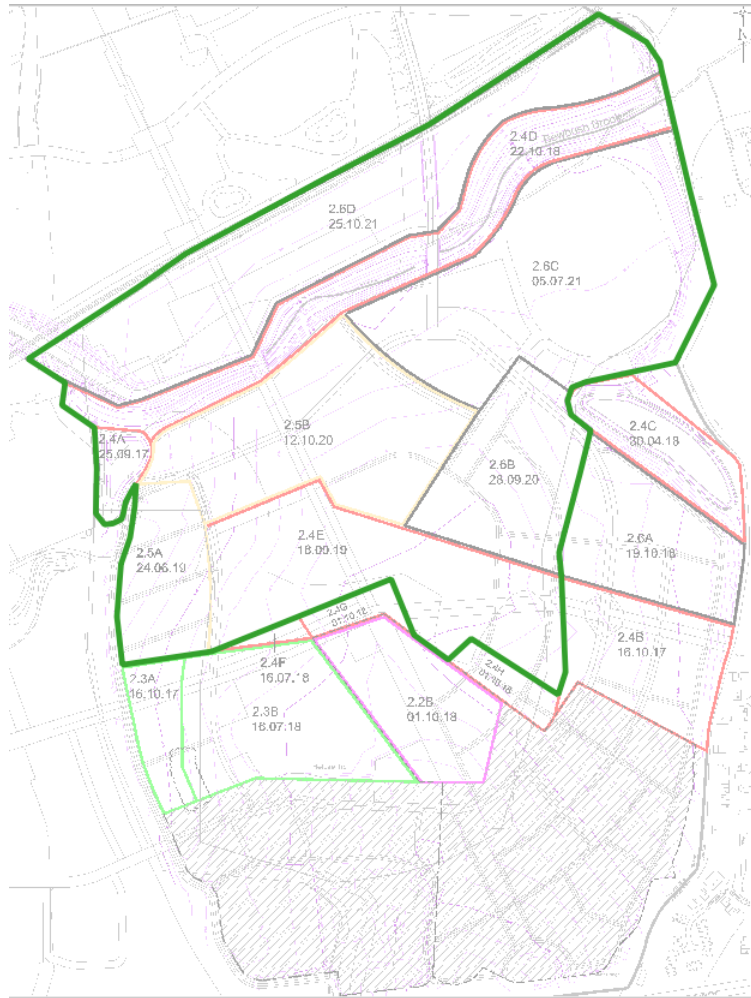


Table 2.1 provides a summary of the Site setting and surrounding land use.

Table 2.1 Site setting

Site address	Kilwood Vale, Crawley, West Sussex	
NGR	TQ 23654 35321	
Area	Approximately 32 ha	
Topography	Site topography gently rises from approximately 78 mAOD in the west and east to 85 mAOD in the centre of the Site. In the southern-most section of the Site, levels rise from approximately 82 mAOD in the west and east rising to 90 mAOD in the centre.	
Surrounding land use	North	The Horsham-Crawley Arun Valley rail link, Future development (Phases 4 and 5 currently agricultural fields), woodland and residential estates.
	South	Kilwood Vale Phases completed to formation level, A264 Crawley Road, Burns Way industrial estate, woodland.
	West	Phase 1 residential development, Hopper's Brook (flowing south to north), then agricultural fields
	East	Residential estates, Spruce Hill Brook (flowing south to north), recreational playing field, Bewbush School.

2.2 Historical Development

The Site previously formed an inert landfill, referred to as 'Land off Horsham Road' by EA (2017). EA (2017) indicates that the landfill accepted waste between December 1976 and January 1989 with the deposited waste being limited to inert materials. The Site has been subject to extensive investigation and assessment which has been reported by other parties (SLR, 2010).

Table 2.2 provides a summary of the land use history for the Site and immediate environs. Information presented in this table has been drawn from historical mapping for the Site, which is presented in Appendix C.

Table 2.2 Land use history

Mapping Date/Scale	On-Site	Off-Site
1879 1:10,560	Site comprises agricultural fields and Bewbush Pond accounts for approximately a third of the Site to the northeast	<p>North: Bewbush (flour) Mill (disused) is present immediately northeast of the Site. Railway line, travelling broadly west to east, bounds the northern boundary of the Site. Ancient Forest and agricultural fields.</p> <p>South: Bewbush Pottery Works, Hopper Farm and Home Farm are present to the south west. 3 No. wells present to the south east of the Site, together with Manor Farmhouse. Holmbush Forest and agricultural fields are present.</p> <p>East and west: Predominately agricultural fields with some ancient forest (including Pondtail Shaw).</p>
1899 1:10,560	No significant changes	No significant changes
1912 – 1913 1:10,560	No significant changes	No significant changes
1932 1:10,560	Electrical power line bisects the Site (east to west)	No significant changes
1938 – 1946 1:10,560	No significant changes	No significant changes
1947 (aerial photograph) 1:10,560	No observable changes	No observable changes
1961 – 1963 1:10,000	No significant changes	No significant changes
1968 1:10,000	No significant changes	No significant changes
1977 – 1979 1:10,000	Bewbush Pond no longer visible. Replaced by a series of drains and Bewbush Brook	No significant changes

Mapping Date/Scale	On-Site	Off-Site
1992 1:10,000	Trees no longer marked on Site	Expansion of Bewbush residential estates to eastern margins of the site boundary.
1999 – 2000 1:10,000	Refuse tip now comprises much of the Site.	No significant changes
2006 1:10,000	Tip expands to the south and now covers approximately 90% of the Site.	No significant changes
2017 1:10,000	Some tracks cross the Site. Now marked as disused workings.	Residences (Phase 1 of Kilwood Vale) present to the south west of the Site.

In addition to the historical uses noted by historical maps in Table 2.2, an Envirocheck report for the Site (Appendix D) and Natural England (2017), returned details of a number of historic landfills in the vicinity of the Site which are summarised in Table 2.3.

Table 2.3 Historic landfills within 1 km of the Site

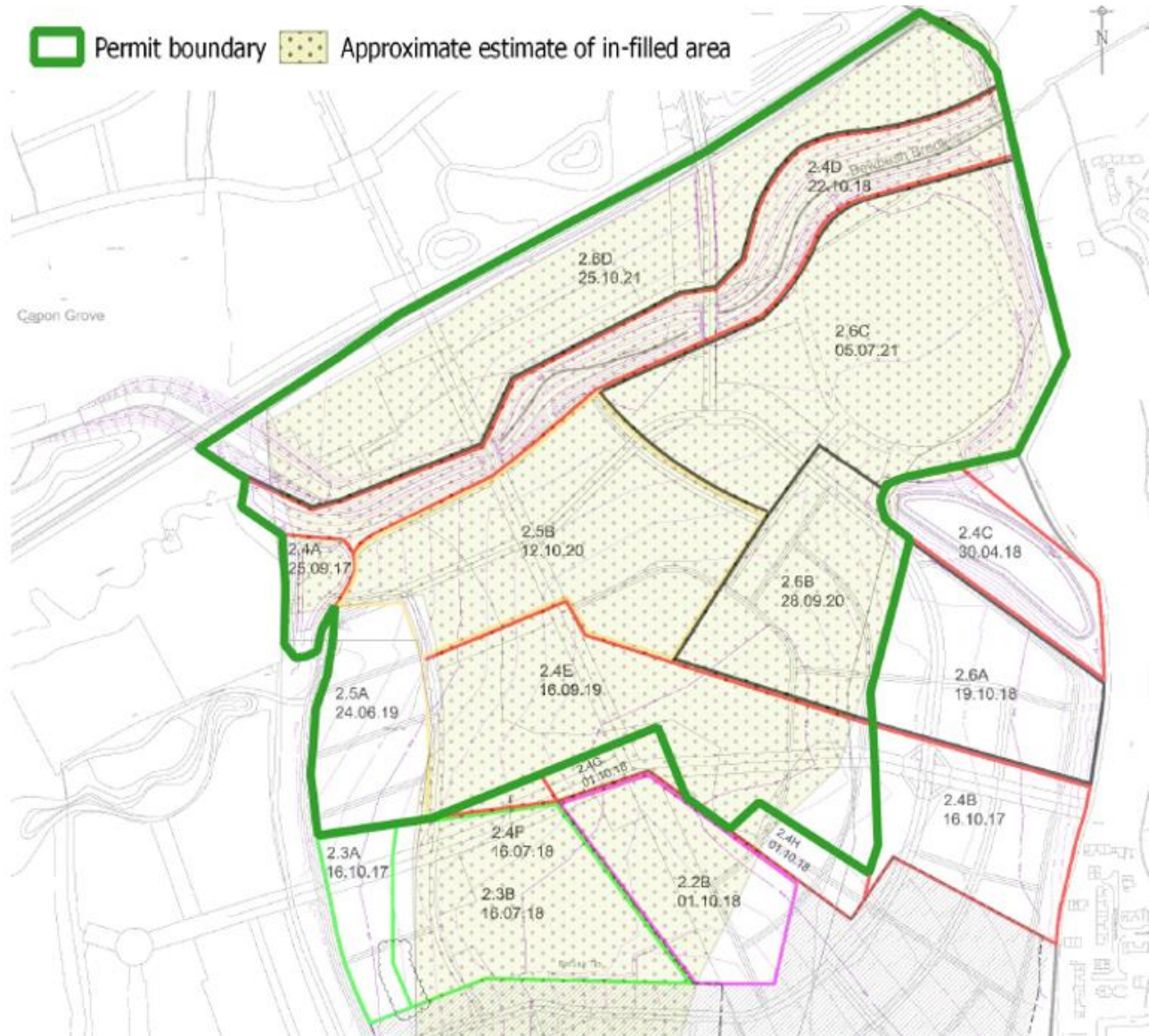
Landfill	Licence holder	Distance from Site (m)	Direction	Landfill type	First received waste	Last received waste	Gas control
Holmbush Farm Landfill	P J Brown	0	On Site	Inert	1991		-
Land off Horsham Road	Matthews Demolition and Excavations Ltd	0	On Site	Inert	Dec 1976	Jan 1989	No
Buchan Park	Not supplied	390	South	Inert, industrial	Dec 1970	Dec 1977	No
Holmbush Potteries	Not supplied	600	South west	Inert, industrial	Dec 1965	Dec 1968	No
Holmbush Farm	Peter John Brown	806	South west	Non-biodegradable (not construction)	Mar 1991	Jun 1997	-

2.3 Current Development

The Development has been sub-divided into a number of phases, which are shown on Figure 2.2. It is understood that Phase 1, located in the south west of the development area, has been completed. Phases 2 and 3 are currently undergoing preliminary development, including soil conditioning using lime and Phases 4 and 5 are yet to be designed.

This application relates to the groundworks required to prepare the development platform suitable for construction, for Phase 2.4 to Phase 2.6 (the Site).

Figure 2.2 Kilwood Vale phasing



2.4 Proposed Development

Dunton Environmental proposes to import, store and use CKD to reduce the moisture content of the receiving, in-situ soil material, in order to construct the Development platform to pre-approved Formation Levels, as shown on Drawing Number 11950- SK07 SK Rev.S6.

The Formation Layer is to be constructed in strict accordance with the Earthworks Specification (CampbellReith, 2017b), which sets out the engineering parameters and testing, required by the

Developer. A copy of the Earthworks Specification is appended to the Operating Techniques Document (ESI report reference 66444R6).

2.4.1 Waste quantities

As detailed in the WRP, the volume of CKD required to achieve the target moisture content varies from 1% - 6% CKD. Based on the tested variability of in-situ soil material, an average of 4% CKD is assumed.

The nature of the treatment activity is dependent on the starting moisture content of the receiving in-situ soil material. This variability causes some level of uncertainty in the volume of CKD to be used and thus the volume of waste (CKD and in-situ soil materials) to be deposited. However, a working estimate has been set out below.

Moisture content in the in-situ soil material in the Phases under development range from 17% to 20%. Assuming an average application rate of 4% CKD, it is estimated that the treatment operation will require the use of 72 tonnes (t) of CKD per day (or 120 m³ based on CKD density of 600 kg/m³).

Based on the treatment operation throughputs, the volume of waste to be deposited for recovery is estimated to be 1.5 Mt for the development platform.

CKD will be stored in four, horizontal silos with a total capacity of 140 t. This is the maximum volume of CKD waste to be stored on Site.

2.4.2 Engineering

The Development platform will be constructed in accordance with the Earthworks Specification, in order to deliver the engineering profile, as required for the Development.

The platform will necessarily be tested to ensure it meets specification.

Placement and compaction of the waste for recovery will be in accordance with Specification for Highway Works (SHW) Series 600, Earthworks.

There will be no permanent slopes associated with the Development. Temporary slopes of surcharge will be formed no steeper than 1 in 3 unless otherwise assessed by an engineer, in accordance with the Earthworks Specification, and are considered to be stable for the approved surcharge material (Class 1 or 2 as defined by SHW).

2.5 Regulated Activities

The proposed waste operations will comprise the importation and storage of CKD, followed by its application to the in-situ soil material, in order to control (reduce) the moisture content of the in-situ soil material, to provide the necessary geotechnical parameters for the Development platform.

The EA has advised (Appendix A) that this activity will comprise both a waste treatment and waste recovery activity (R5).

2.5.1 Formation level

The Site, as it stands, requires an element of cut and fill in order to achieve the required Formation Landform for the Development platform. Contours to be achieved (Formation Level), including cut and fill volumes, are reflected on Drawing Number 11950-SK07 SK Rev.S6.

The waste recovery operation at the Site aims to rationalise the level differences and deliver the Formation Level required for the Development platform.

As detailed in Section 3.1, much of the Site is underlain by Made Ground associated with the infilling of former excavations. Site investigations have revealed that the Made Ground is not considered suitable for direct foundations without some form of ground improvement.

In order to achieve the physical properties required to deliver the engineered Formation Level, the Operator will dose the in-situ soil material with the required volume of CKD. The dosing rate will be carried out on a phased basis, following moisture content analysis of the receiving material.

Addition of excess CKD would result in exceeding the target moisture content, in order to achieve optimal compaction and low permeability of the Formation level. Based on moisture content analysis of existing in-situ soil materials, an estimated dosing rate of between 1% and 6% CKD is estimated. As such, it is considered essential that the Operator uses the minimum volume of CKD in the treatment operation. The dosing range of CKD is small, such that excess use is not considered meaningful.

The waste volumes required in creation of the development platform have been considered by the EA in assessment of the approved WRP (Appendices A & B).

2.5.2 Waste types

Proposed waste types to be used in the waste treatment operation are listed in Table 2.4 and will comprise CKD only.

Table 2.4 Waste codes for waste treatment operation

EWC	Description
10	Wastes from thermal processes
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12

Waste types to be used in the waste recovery operation are listed in Table 2.5 and will comprise in-situ soil materials which will have been mixed with CKD, for moisture conditioning purposes, only.

European waste catalogue (EWC) code 10 13 13 is a 'mirror hazardous' waste code, meaning that the waste must be tested in order to demonstrate its non-hazardous nature.

The proposed waste types to be accepted by the waste recovery operation are presented in Table 2.5. The waste will comprise the combination of the imported CKD and in-situ soil materials. As such, the waste will be created on-site, and waste acceptance criteria (WAC) does not apply to this waste type.

Table 2.5 Waste codes for waste recovery operation

EWC	Description
19	Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
19 02	Wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)
19 02 03	premixed wastes composed only of non-hazardous wastes

2.5.3 Permitted activities

With respect to the waste recovery operation, provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste, it is the Operator's intention to carry out the following operations under the proposed waste recovery permit:

- R13: Storage of wastes pending any of the operations numbered R3 and R5;
- R3: Recycling / reclamation of organic substances which are not used as solvents; and
- R5: Recycling or reclamation of other inorganic materials.

2.5.4 Waste acceptance procedure

The waste acceptance procedure (WAP) for the Site is included in Operating Techniques document accompanying this application (ESI report reference 66444R6).

3 Geo-environmental setting

ESI has also been instructed by Dunton Environmental to undertake a Hydrogeological Risk Assessment (HRA), which accompanies this application (ESI report reference 66644R1). The HRA presents further information relating to the Site geo-environmental setting and Conceptual Site Model with respect to the proposed use of CKD. A brief summary of the geo-environmental setting is provided in this section. More detailed information can be found in the HRA.

3.1 Geology

3.1.1 Regional geology

The bedrock geology is Mudstone of the Weald Clay Formation. Superficial geology is largely absent, though there are isolated deposits of Sand and Gravel (River Terrace Deposits – Quaternary Period) with Alluvium (Clay, Silt, Sand and Gravel) from the Quaternary Period found in the environs of the Bewbush Brook.

3.1.2 Local geology

Made Ground is evident across approximately 70% of the Site related to the former inert landfill. The thickness of the Made Ground is reported to be highly variable (between 0.35 m and 12.0 m) (SLR, 2010). The Made Ground at the Site (inert waste fill materials associated with Holmbush Landfill) comprises light brown to grey fine to coarse silty sandy gravel to boulders of crushed concrete with varying amounts of brick, plastic, metal and timber.

3.2 Hydrogeology

The Site is underlain by Weald Clay which is classified by the EA as a 'non-aquifer', with a narrow exposure of the Horsham Stone Member (Secondary A Aquifer) outcropping at the northern boundary of the Site. Secondary A aquifers contain permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

CampbellReith (2016a) notes that there is localised groundwater present in sandy bands within the Weald Clay. It is unlikely that there is any significant hydraulic connection between these bands and thus the bulk permeability of the Clay will be low.

There are no groundwater abstraction wells within 1 km of the Site (Appendix D), confirming that the Weald Clay strata do not provide any groundwater resource. CampbellReith (2016a) notes that disused wells are shown on Ordnance Survey mapping which it considers not to have intercepted significant quantities of water.

The Site is not located in a groundwater protection zone.

3.3 Hydrology

Bewbush Brook begins midway through the northern extents of the Site, flowing eastwards and feeding into Ilfield Mill Pond. Spruce Hill Brook runs south to north along the Site's eastern boundary and feeds into Bewbush Brook. These water features subsequently discharge to the River Mole.

The Envirocheck report (Appendix D) notes that there is one surface water abstraction, 815 m south west of the Site, which supplies agriculture at Holmbush Farm.

3.3.1 Subsurface pathways

There are no sub-surface pathways which may act as preferential pathways for contamination migration.

4 Monitoring and closure

4.1 Water Monitoring

The HRA (ESI report reference 66444R1) concludes that there is no appreciable risk to surface water from the Site, in particular to Bewbush Brook. As such, monitoring is not considered to be required.

Groundwater is determined to not be present, or not to provide a continuous groundwater resource. In addition, the reduced permeability following placement of the recovered wastes will prevent percolation through the waste and any leaching potential, meaning the risk to groundwater is low. As such, no groundwater monitoring is proposed.

4.2 Ground Gas Monitoring

EA guidance (EA, 2016b), provides that unless your risk assessment shows it isn't necessary; if waste is deposited more than 2 m below the surrounding ground level, then ground gas monitoring is required at a density of at least two boreholes per hectare, with a minimum of four boreholes per site. Boreholes must extend to the full depth of the waste.

The recovered wastes will be placed to a maximum depth of 4 m below ground level, to be determined by the existing moisture content of the material and the earthworks design. It is acknowledged that the inorganic nature of the CKD means it does not present any gas generating potential. The combined in-situ material and CKD waste represents a reduced gas generating potential than existing.

A programme of ground gas monitoring is proposed by the Developer following construction of the Formation Layer, in order to assess the residual gas risk to overlying properties. This programme is outlined in the Remedial Strategy (CampbellReith, 2017b) (see Appendix C of ERA ESI report reference 66444R5). Should residual ground gas be higher than anticipated, additional ground gas protection measure will be incorporated to the building design. However, this risk is considered beyond the scope of this application and is not considered further.

Ground gas risk to adjacent receptors has been assessed as being of low risk (see accompanying ERA, ESI report reference 66444R5), and consequently, no perimeter ground gas monitoring infrastructure is proposed.

4.3 Noise

Condition 33 of planning permission DC/15/2813 requires submission of noise mitigation in the form of a CEMP. Noise monitoring is carried out under the requirements of this CEMP. It is considered that the risk due to noise is controlled by planning.

The risk of noise pollution from the proposals is considered to be low (see ERA ESI report reference 66444R5). As such, no noise monitoring is proposed.

4.4 Fugitive Emissions Monitoring

4.4.1 Dust

Condition 33 of planning permission DC/15/2813 requires the submission of dust mitigation techniques to be employed and a scheme for the monitoring of dust emissions at the boundary, is submitted in the form of a Construction Environmental Management Plan (CEMP). It is considered that the risk of pollution from dust is controlled by planning.

The risk of pollution as a result of dust from the Site is considered to be appropriately mitigated (see ERA report reference 66444R5). As such, no dust monitoring is proposed.

CKD will be carefully managed to prevent dust emissions during delivery and transfer, see Method Statement DE – MS – 01/2018 in Operating techniques document (ESI report reference 66444R6).

4.4.2 Odour

Odour is not considered to present a risk at the Site (see ERA report reference 66444R5). No odour monitoring is proposed.

4.5 Post Closure Controls (Aftercare)

The Site does not comprise a landfill or a Category A mining waste facility. As such closure details are not required.

Once the site has been restored to the agreed contours, a final topographical survey will be undertaken and a permit surrender application will be prepared. No settlement is expected as the material will have been placed in accordance with Manual Contract of Documents for Highway Works, Volume 1, Specification for Highways Works, Series 600 – Earthworks.

4.6 Site Condition Report

As the Site involves the permanent deposit of waste to land, EA site condition report guidance (EA, 2013b) states that a site condition report is not required.

REFERENCES

- CampbellReith, 2017a.** Kilnwood Vale Phase 2.5 Environmental Review and Remedial Strategy. Campbell Reith Hill LLP, July 2017.
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- EA, (2013b).** Horizontal Guidance 5 (H5) Site condition report – guidance and templates. Guidance for applicants. Environment Agency, v.3 April 2013.
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- Natural England, (2017).** Magic interactive maps, [online]. Available at: <http://www.natureonthemap.naturalengland.org.uk/>, accessed 12 October 2017.

FIGURES

66444D1	Location plan	Scale: 1:50,000@A4
66444D2	Kilnwood Vale receptors	Scale: 1:22,000@A4
66444D3	Permit boundary	Scale: 1:6,000@A4
11950-SK07 SK Rev.06	Phase 2 and 3 cut/fill grid of levels	Scale: 1:1,250@A0

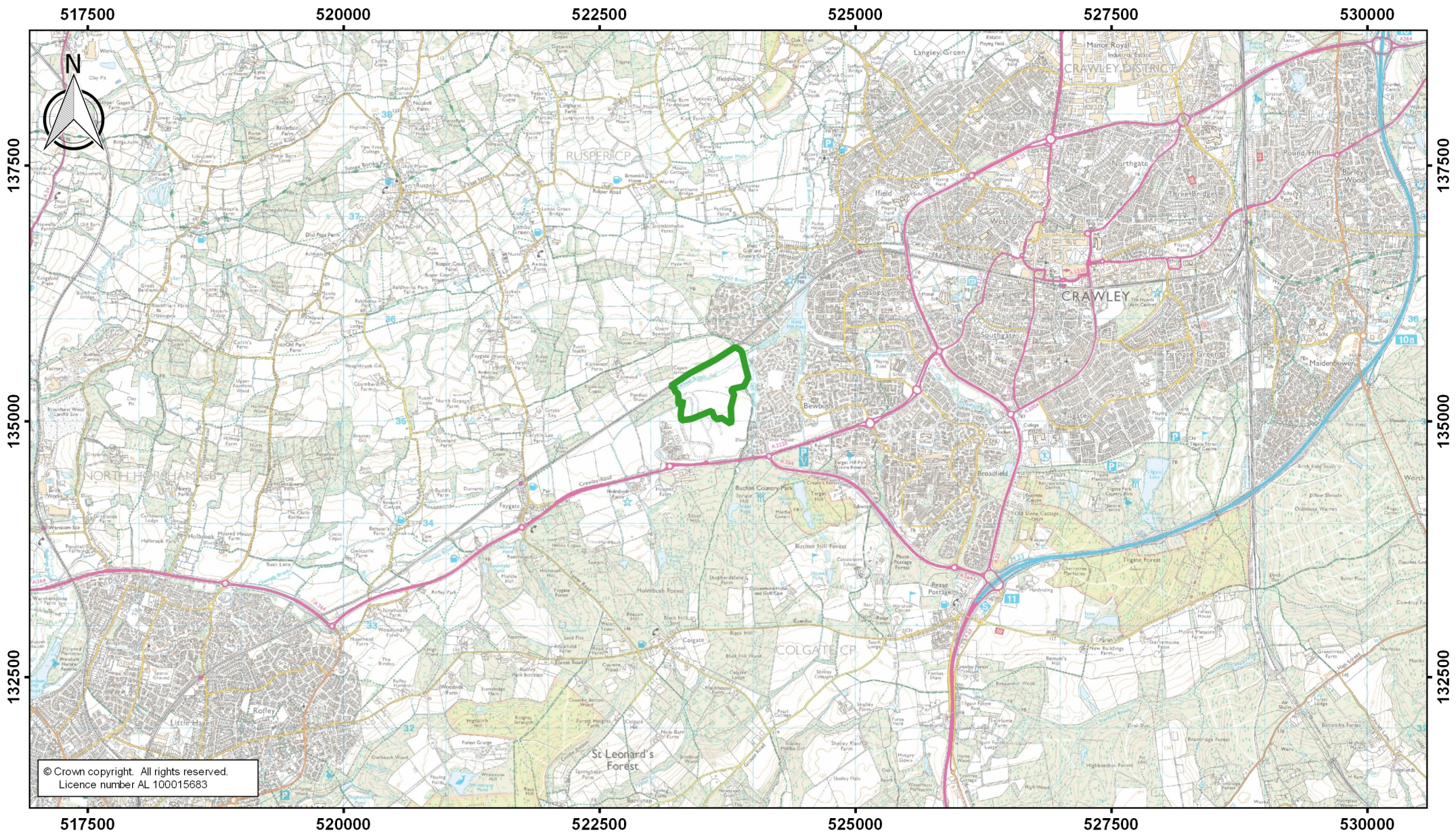
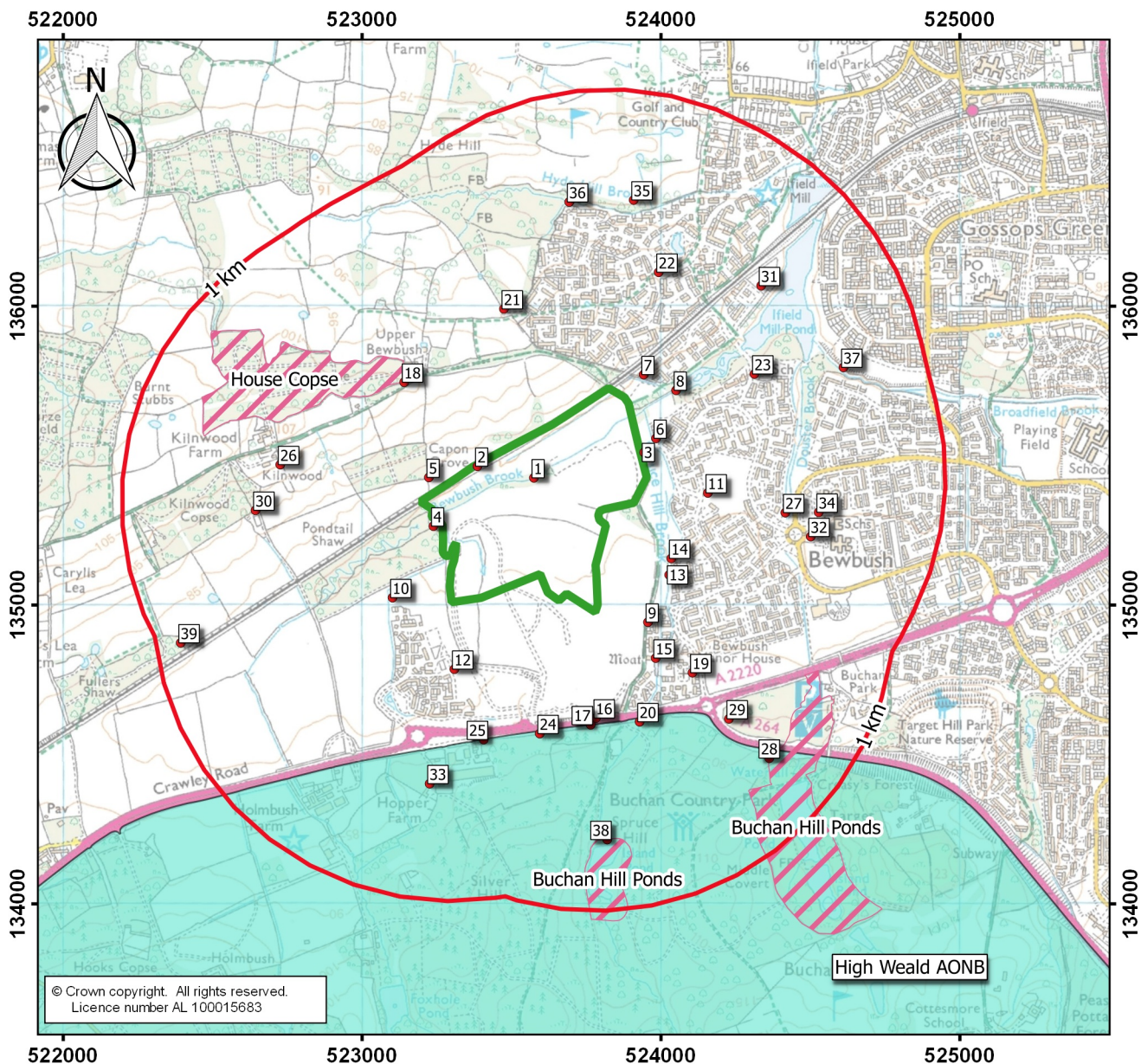


Figure 66444D1

Site location -  Permit boundary

Date	Jan-2018	Drawn	OJH
Scale	1:50,000	Checked	KLB
Original	A4	Revision	1
File Reference	O:\66444 Kilnwood Vale\Reports\Permit application\66444R4 ESDD\Figures\Site location.qgs		





No.	Receptor
1	Bewbush Brook
2	Arun Valley Railway Line
3	Bewbush West Playing Field
4	Rainbow field, pond tail, & shaw
5	Capon Grove
6	Properties on Gemini Close
7	Properties on Waterfield Gardens
8	Ifield Mill Pond
9	Manorfields residential estate
10	Hopper's Brook
11	Bewbush Green Playing Field
12	Kilnwood Vale Park
13	Spruce Hill Brook
14	Properties on Masefield Rd.
15	Moated Site at Bewbush Manor
16	A264 - Crawley Road
17	High Weald (AONB)
18	House Copse SSSI
19	Barn to SE of Bewbush Manor
20	Spruce Hill Brook

No.	Receptor
21	Hyde Hill
22	Tesco
23	Waterfield Primary School
24	Holmbush Forest
25	Industrial Estate
26	Kilnwood Farm
27	Douster Brook
28	Buchan Hill Ponds SSSI (East)
29	Buchan Country Park
30	Kilnwood Copse
31	Millpond Adventure Playground
32	Bewbush Centre
33	Hopper Farm
34	Various shops
35	Ifield Golf Club
36	Hyde Hill Brook
37	Broadfield Brook
38	Buchan Hill Ponds SSSI (West)
39	Fuller's shaw

Figure 66444D2

Potential receptors

- Potential receptors
- 1 km Site buffer
- ▭ Permit boundary

Date	Jan-2018	Drawn	OJH
Scale	1:22,000	Checked	KLB
Original	A4	Revision	1
File Reference	O:/66444 Kilnwood Vale/Reports/Permit application/66444R5 ERA/Figures/Potential dust receptors.qgs		



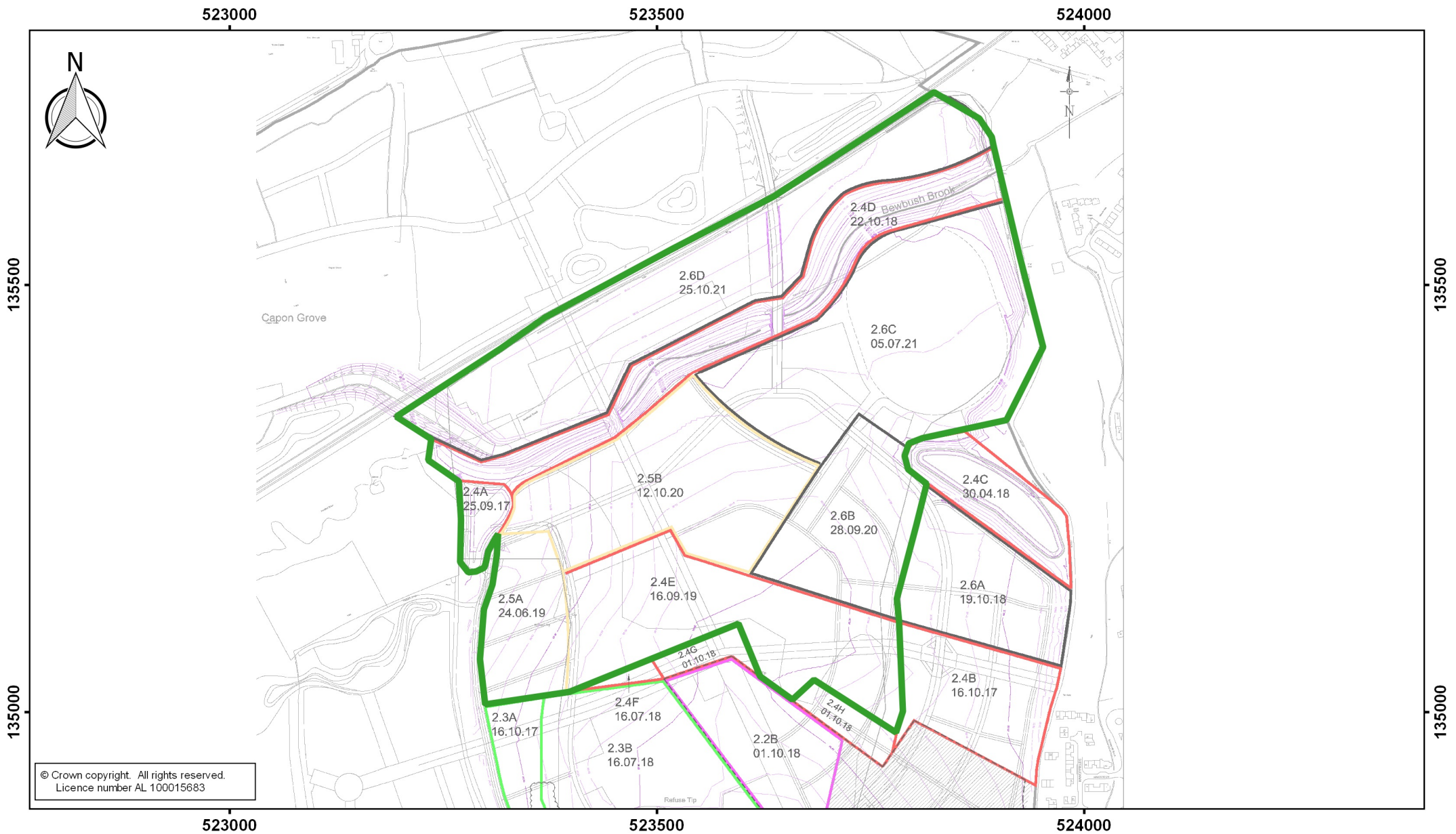


Figure 66444D3

Kilnwood Vale: Permit Boundary

 Permit boundary

Date	Jan-2018	Drawn	KLB
Scale	1:6,000	Checked	KLB
Original	A4	Revision	1

File Reference
 O:/66444 Kilnwood Vale/Reports/Permit application/66444R4
 ESSD/Figures/Permit boundary 66444D3.ggs





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 - C - CONSTRUCTION - Fully developed drawings issued under instruction for construction.
- ONLY STATUS C DRAWINGS TO BE USED FOR CONSTRUCTION.**

6. The cut and fill has been calculated assuming that 200mm of top soil has been removed from the existing topographical survey levels and all material is suitable for reuse.

7. proposed levels are based on 11950-SK43-S10

LEGEND

- BULK EARTHWORK PLATFORMS
- PROP B/E CONTOURS (MAJOR)
- EXT B/E LEVELS
- PROP B/E LEVELS
- NET CUT
- NET FILL

TOTAL CUT = 610500 M³
 TOTAL FILL = 608100 M³
 NET CUT = 2400 M³

No	Description	Date	By
S6	NOTE 7 ADDED, DRAWING TITLE REVISED	29.04.16	NEJ
S5	PROPOSED LEVELS REVISED	11.04.16	NEJ
S4	ISSUED FOR INFORMATION	17.11.15	NEJ
S3	ISSUED FOR INFORMATION	05.02.15	NEJ
S2	ISSUED FOR INFORMATION	27.01.15	NEJ
S1	ISSUED FOR INFORMATION	09.01.15	NEJ

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Job Title: **KILWOOD VALE, CRAWLEY**
 Client: **CREST NICHOLSON**

**PHASE 2 AND 3
 CUT/FILL GRID OF LEVELS**

drawn	date	scale	Cl checked	CAD filename
NEJ	05.02.15	1:1250@A0		11950SK07

Job No.	Drp No.	SK07	Status/Revision
11950		SK07	S6

APPENDICES

Appendix A

Environment Agency recovery vs disposal decision letter

From: Watts, Anthony
To: [Kate Brady](#)
Subject: Kilnwood Vale - Proposed DFR activity
Date: 04 January 2018 16:19:40
Attachments: [image001.gif](#)
[image002.gif](#)
[image003.gif](#)
[image004.gif](#)
[image005.gif](#)
[image006.png](#)

Dear Kate,

Further to my email dated the 12th of December 2017 we have come to a decision regarding the proposed recovery activity. Please note that this advice is based on the information supplied to us at the pre-application stage and does not mean that additional information will not be asked for when an application is received. In summary the proposed activity could be authorised under a site based bespoke permit, providing that the treatment and deposit for recovery activity are clearly defined and justified, that all risks have been identified and appropriate controls and mitigation measures put in place. Please see further explanation below.

The application of waste cement kiln dust (CKD) in this instance is being used to treat soils to improve their performance and to allow the creation of a construction platform that meets agreed engineering specifications. The proposed activity should be described as a R5 activity, i.e. recycling or reclamation of other inorganic materials, in relation to the use of the waste CKD. The treatment of the in-situ soils would not require a waste authorisation if being undertaken using a non-waste material to improve geotechnical properties (CL:AIRE DoWCoP Appendix 8 Q6.). In this instance as a waste material is being used the activity can be considered for its suitability under either a mobile or site based permit. The site based Standard Rules permit SR2015 No39 authorises R5 activities, however the introductory text notes the following:

- If you need to deploy mobile plant under a mobile plant permit at a site that is subject to a site based permit to enable you to complete the recovery activity, there will be inconsistencies between the requirements of the two permits. In this situation the requirements of the site based permit prevail. Therefore you must be able to deliver the desired recovery activity through use of these standard rules alone, without relying upon the subsequent use of a separate mobile plant permit. If you need to use additional waste types or quantities to those allowed under these standard rules then you should apply to do this under a bespoke permit.

We would consider in this instance that the application of waste CKD and the recovery of the resulting material is both a waste treatment and a recovery activity, which would be authorised under an R5 activity. As the combined proposals require a site based permit and include waste streams that are excluded from the standard rules permit SR2015No39 this would require a bespoke application for Deposit for Recovery to be submitted to cover the proposed site based activities.

Any future application would require additional information to be considered as part of the determination and I have highlighted some of the points that you may wish to consider. This is not an exhaustive list and further information may be requested at the application stage.

- You need to demonstrate that the work would go ahead with non-waste if waste were not available. If you are relying on a statutory obligation under a Section 106 agreement please confirm with references that the agreement covers all areas proposed to be included within the treatment and recovery area.
- You need to outline in detail the volume of soil that requires treating and evidence that there is a clear benefit for undertaking the works. This will inform whether the minimum amount of waste is being used and the proposal can be considered recovery. Where this is not possible you must provide a robust methodology showing how mixing ratios will be assessed on site and how the application of waste will be controlled to meet the agreed engineering standards

whilst using the minimum amount of waste necessary.

- You need to show what affect the application of waste CKD will have on the receiving subsoil and the quality of that material prior to treatment which should be inert sub soil. This is to ensure that resulting mixture will not pose a risk to groundwater and surface waters.
- With regards to the landfill which underlies the site a detailed hydrogeological risk assessment should be submitted to support any application to address the potential risk of the proposed activity to the underlying waste mass. This should include (but not limited to) in-waste characterisation, hydrological risk assessment, proposals for gas and groundwater quality monitoring wells and a details of ongoing monitoring to be undertaken on the site boundary during the lifetime of the permit.
- You must include full details on how you will characterise the waste CKD brought to site. This must include a description of each of the waste suppliers and sufficient information to satisfy the Environment Agency that the material is non-hazardous. The waste acceptance criteria, on site testing and waste management procedures must also be sufficient to deal with the material brought to site and the risk to the surrounding environment.
- Where the waste CKD is hazardous Industrial emission directive thresholds will apply for the site based permit and an appropriate application should be made.

If you have any further questions please contact me to discuss. However please note that you have exceeded the fifteen hours of pre-application advice available for a bespoke permit application. Therefore any future engagement at this stage may be charged in accordance with Page 21 of the Fees and Charging Document which can be found [here](#).

Kind regards,

Anthony Watts

Waste Permitting Officer

Environment Agency | Horizon House, Deanery Road, Bristol, BS1 5AH

Anthony.watts@environment-agency.gov.uk

External: 020 847 45331

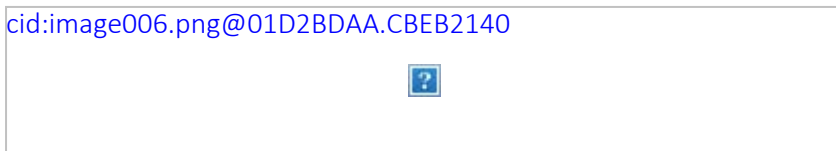
Internal: 45331

We are currently reviewing how much we charge for our work. Please tell us your views about the Environment Agency Charge proposals by taking part in our online consultation which is running until 12 January 2018. For a paper version of the consultation call 03708 506 506:

<https://consult.environment-agency.gov.uk/engagement/environmentagency-charging-proposals-fromapril2018/>



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Appendix B

Approved waste recovery plan

Kilnwood Vale: Waste recovery plan



Kilnwood Vale: Waste recovery plan

Prepared for

Dunton Environmental Ltd
Unit 1, Tamebridge Industrial Estate,
Aldridge Road,
Perry Barr,
West Midlands,
B42 2TX

Report reference:
66444R2, November 17

Report status:
Final Report

CONFIDENTIAL
Prepared by ESI Limited

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Kilnwood Vale: Waste recovery plan

This report has been prepared by ESI Ltd. (ESI) in its professional capacity as environmental specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by ESI solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to ESI at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, ESI may, by prior written agreement, agree to such release, provided that it is acknowledged that ESI accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. ESI accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against ESI except as expressly agreed with ESI in writing.

Kilnwood Vale: Waste recovery plan

	Name	Signature
Author	Kate Brady	
Checked by	Chris Berryman	
Reviewed by	Francis Crozier	

Revision record:

Issue	Date	Status	Comment	Author	Checker	Reviewer
1	01 November 2017	Draft	Draft for client comment	KLB	CJB	FKC
2	17 November 2017	Final	Incorporated client comments	KLB	CJB	FKC

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APPENDICES

- Appendix A Planning decision notice DC/10/1612 (17 October 2017)
- Appendix B Planning decision notice DC/13/1437 (14 February 2014)
- Appendix C Planning decision notice DC/15/2813 (28 April 2016)
- Appendix D Kilnwood Vale Phase 2.3 Earthworks Specification (Campbell Reith, 2016d)
- Appendix E Kilnwood Vale Phase 2.4 – 2.6 Earthworks Specification (Campbell Reith, 2017c)
- Appendix F Section 106 Agreements
- Appendix G Moisture Content Laboratory Sheets
- Appendix H Hydrogeological Risk Assessment (ESI, 2017)
- Appendix I Waste Classification Assessments

1 Introduction

1.1 Background

ESI Limited (ESI) has been instructed by Dunton Environmental Limited (Dunton Environmental) to produce a Waste Recovery Plan (WRP) to permit the use of recovered Cement Kiln Dust (CKD) waste, for soil moisture conditioning purposes, in the construction of the development platform within Phases 2 and 3 of Kilwood Vale, west of Crawley, West Sussex.

Dunton Environmental has been instructed by Crest Strategic Projects (the Developer) to construct the development platform at Kilwood Vale and is currently conditioning in-situ soils using lime in order to manage the moisture content. Dunton Environmental is seeking to use CKD as an alternative to lime. CKD is a waste product from the manufacture of cement and, as such, Dunton Environmental will require an Environmental Permit in order to mix CKD into in-situ soils. This WRP seeks to demonstrate that the proposed use of CKD may be considered as a waste recovery activity, thereby using suitable waste material in direct substitution for the existing non-waste alternative.

1.2 Planning Status

The Kilwood Vale development is a major strategic development in the south-east of England including c.2,500 dwellings, schools, transport infrastructure, amenity facilities, and employment development.

The development has been the subject of three separate consents issued by Horsham District Council. Table 1.1 provides a summary of the planning permission history.

Copies of the planning consents are presented in Appendices A to C.

It should be noted that permissions DC/10/1612 and DC/15/2813 are the same except for variations to Conditions 3, 4, 7, 8, 9 and 10 in DC/15/2813.

Table 1.1 Planning permission summary

Reference no.	Date	Comment
DC/10/1612	17 October 2011	Part A: Outline approval for development of approximately 2,500 dwellings, new access from A426, secondary access to A246, neighbourhood centre, pumping station, land for primary school and nursery, land for employment, new rail station, energy centre and amenity space. Part B: Engineering operational associated with landfill remediation and associated infrastructure including pumping station.
DC/13/1437	14 February 2014	Engineering operations associated with landfill remediation and associated infrastructure including pumping station.
DC/15/2813	28 April 2016	Variation of Conditions 3,4,7,8,9,10 of DC/10/1612. This permission supersedes DC/10/1612 Part B and appears to also supersede DC/13/1437

2 Site setting

2.1 Site Location

The Kilwood Vale development is situated off the A264 (Crawley Road), approximately 2km west of Crawley, West Sussex. The entire development area covers approximately 140ha. The areas which are the subject of this WRP comprise Phases 2 and 3 (the Site), covering approximately 60ha, (Figure 2.1).

Figure 2.1 Site location

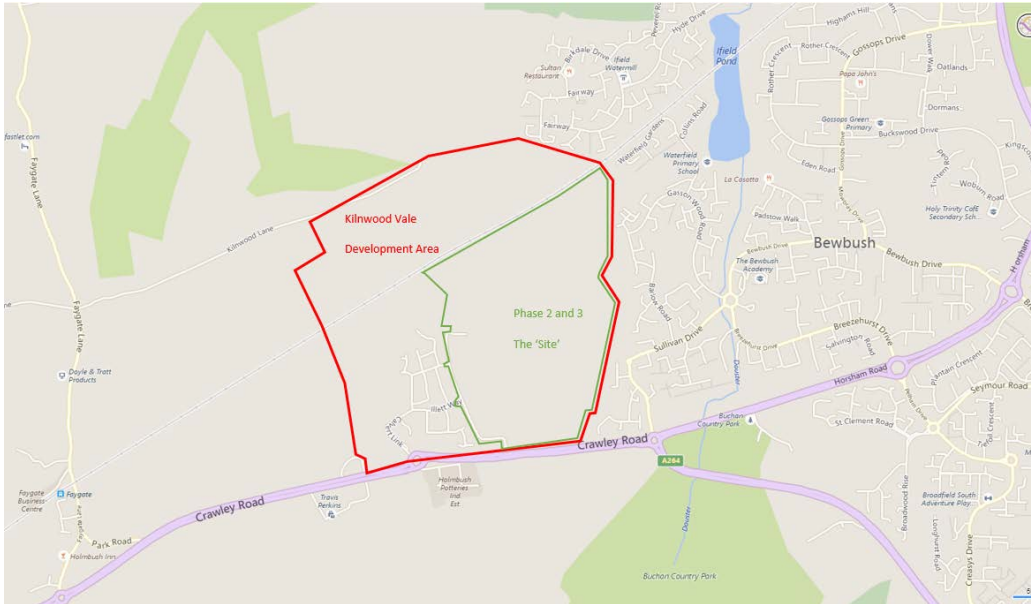


Table 2.1 Site setting

Site address	Kilwood Vale, Crawley, West Sussex	
NGR	TQ 23754 35161	
Area	Approximately 60ha	
Topography	Site topography gently rises from approximately 78mAOD in the west and east to 85mAOD in the centre of the Site. In the southern-most section of the Site, levels rise from approximately 82mAOD in the west and east rising to 90mAOD in the centre.	
Surrounding land use	North	The Horsham-Crawley Arun Valley rail link, Future development (Phases 4 and 5 currently agricultural fields), woodland and residential estates.
	South	A264 Crawley Road, Burns Way industrial estate, woodland.
	West	Phase 1 residential development, Hopper's Brook (flowing south to north), then agricultural fields
	East	Residential estates, Spruce Hill Brook (flowing south to north), recreational playing field, Bewbush School.

2.2 Historical Development

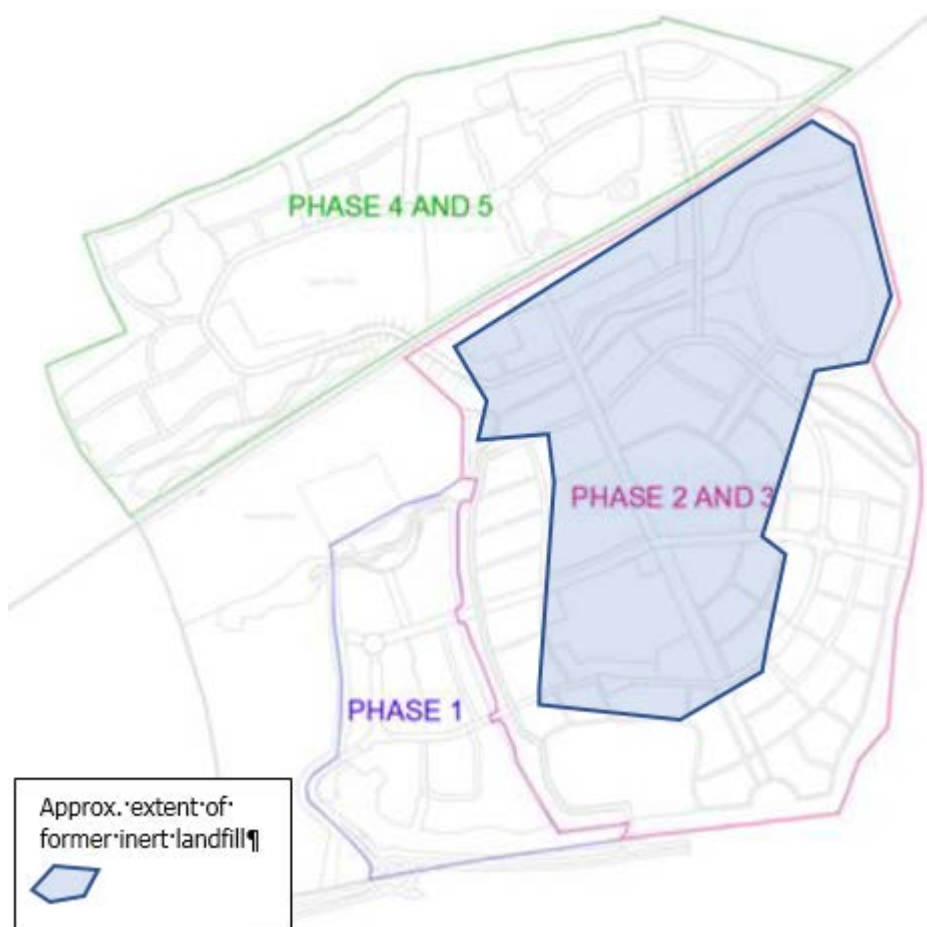
The Site (Phases 2 and 3) previously formed an inert landfill, referred to as 'Land off Horsham Road' by Environment Agency (EA) (2017). EA (2017) indicates that the landfill accepted waste between December 1976 and January 1989 with waste deposited limited to inert materials. The Site has been subject to extensive investigation and assessment which has been reported by other parties (SLR, 2010).

2.3 Current Development

The Kilwood Vale development site has been sub-divided into a number of phases which are shown on Figure 2.2. It is understood that Phase 1, located in the south west of the development area, has been completed. Phases 2 and 3 (the Site) are currently undergoing preliminary development, including soil conditioning using lime and Phases 4 and 5 are yet to be designed.

This WRP relates to the groundworks required to prepare the development platform suitable for construction, for Phases 2 and 3 (the Site) which comprises the area of historical inert landfill.

Figure 2.2 Kilwood Vale phasing



2.4 Geo-environmental Setting

In conjunction with this WRP, ESI has also been instructed by Dunton Environmental to undertake a Hydrogeological Risk Assessment (HRA) for the Site (ESI, 2017). The HRA presents further information relating to the Site geo-environmental setting and Conceptual Site Model with respect to the proposed use of CKD. A brief summary of the geo-environmental setting is provided in this section.

2.4.1 Geology

The bedrock geology is Mudstone of the Weald Clay Formation. Superficial geology is largely absent, though there are isolated deposits of Sand and Gravel (River Terrace Deposits – Quaternary Period) with Alluvium (Clay, Silt, Sand and Gravel) from the Quaternary Period found in the environs of the Bewbush Brook.

Made Ground is evident across approximately 70% of the Site related to the former inert landfill. The thickness of the Made Ground is reported to be highly variable (between 0.35m and 12.0m) (SLR, 2010).

2.4.2 Hydrogeology

The Site is underlain by Weald Clay which is classified by the EA as a non-aquifer, with a narrow exposure of the Horsham Stone Member (Secondary A Aquifer) outcropping at the northern boundary of the Site.

2.4.3 Hydrology

Bewbush Brook begins midway through the northern extents of the Site, flowing eastwards and feeding into Ilfield Mill Pond. Spruce Hill Brook runs south to north along the Site's eastern boundary and feeds into Bewbush Brook. These water features subsequently discharge to the River Mole.

3 Demonstrating recovery

The application of CKD as a substitute for lime is considered to be a waste recovery activity rather than a waste disposal activity as the primary reason for the work is to achieve a clear benefit, which the Developer has an obligation to undertake.

3.1 Environment Agency recovery guidance

The EA recovery guidance (Environment Agency, 2016) provides a series of 'tests' which ESI considers make recovery possible for the development works at the Site. This guidance replaces former EA waste recovery guidance (Environment Agency, 2010) which was withdrawn following the 2015 'Methley' Court of Appeal Judgement (Tarmac, 2015).

In order to apply for a waste recovery permit, a WRP must be prepared for, and approved by the EA. The guidance states that in order to demonstrate recovery:

You must send a waste recovery plan when you're applying for either a standard or bespoke waste recovery permit. The Environment Agency will assess your plan to check your operation is a waste recovery activity.

Your plan must show that if you couldn't use a waste material you would do work to get the same outcome using non-waste materials. You must include evidence of this in your plan.

You could provide evidence that you're obliged to carry out the work:

- This could be because a regulator has imposed a requirement on you. For example, you operate a quarry and are required by planning conditions to restore it according to an approved plan.*
- This isn't the same as a planning permission, which allows you to do certain work without setting obligations.'*

The above extract from the guidance outlines the requirements to demonstrate that there is an obligation to carry out the work. This is the means by which waste recovery will be demonstrated in this WRP.

3.2 Statutory Obligations

Planning consent DC/15/2813 (Appendix C) contains a number of Conditions which expressly require Site-improvement works to be carried out. A number of reports have been commissioned to discharge these specific Conditions as summarised in Table 3.1.

Table 3.1 Relevant conditions in permission DC/15/2813

Condition No	Comment	Corresponding report
Part A, Condition 27 (Reserved Matters – Surface Water Drainage Strategy)	<p>The Reserved Matters include a Surface Water Drainage Strategy which needs to include:</p> <ul style="list-style-type: none"> • Consideration of pollution prevention measures to protect watercourses and groundwater; and • Confirmation that there will be no discharge to ground in areas affected by contamination. 	Kilwood Vale Site Wide Drainage Strategy Report Rev D5. CampbellReith report for Crest Nicolson Operations (December 2016)

Condition No	Comment	Corresponding report
	Condition 27 will need to cover potential impacts of Site construction works on the local surface water drainage, including prevention of contamination of surface water or ground water form runoff from stabilised soils.	
Part A, Condition 28 (Contaminated land remediation strategy and verification reporting)	No development of any phase (excluding Phase 1) shall begin until a scheme to deal with the risks associated with contamination of the site shall be submitted and approved by the LPA. The scheme will include: <ol style="list-style-type: none"> 1. Preliminary risk assessment; 2. Site investigation; 3. Detailed risk assessment and remediation strategy; and 4. Verification plan for the remediation strategy. 	Kilwood Vale Phase 2.3 Environmental Review and Remedial Strategy. CampbellReith report for Crest Strategic Projects (July 2016) Kilwood Vale Phase 2.4 Environmental Review and Remedial Strategy. CampbellReith report for Crest Strategic Projects (June 2017) Kilwood Vale Phase 2.5 Environmental Review and Remedial Strategy. CampbellReith report for Crest Strategic Projects (July 2017)
Part A, Condition 29 (Verification report approval by the LPA)	No occupation of dwellings until a verification report demonstrating completion of the remediation work has been approved by the LPA.	
Part B, Condition 49 (The development works will be carried out in accordance with a CEMP (Construction Environmental Management Plan) approved by letter dated 03/10/12)	The CEMP should include how the construction will comply with the sustainable use of soils in construction on Site. Permission DC/15/2813 does make any specific reference to soil moisture conditioning but the CEMP (Condition 49) should address the use of soils in construction on site, including their stabilization using additives (eg lime or CKD).	Kilwood Vale Construction Environmental Management Plan. CampbellReith report for Crest Nicolson Operations (December 2016)

3.2.1 Reports addressing Conditions

3.2.1.1 Drainage strategy

CampbellReith (2016a) provides a drainage strategy (foul and surface water) for Phase 2 and 3, noting that: design is complete for Phase 1 (construction also completed); and design for Phases 4 and 5 is yet to be completed.

The report notes that:

- Phase 2.1 Road sewers will be constructed on land that was used as landfill. To minimise the risks of pipe joints opening up and having back falls on sewers due to differential settlements

within the former landfill area, the ground under the Phase 2.1 Road will first be improved as detailed in the CampbellReith's "Phase 2.1 'Blue Area' Earthworks Specification, 2015".

- The Spine Road sewers will be constructed on natural clay and no 'special ground improvements' or modification to the bedding will be necessary.

3.2.1.2 Remediation strategies

Remediation strategies listed in Table 3.1 (CampbellReith 2016b, 2017a and 2017b) provide review of historical investigation reports for Phases 2 and 3 with particular focus on sub-Phases 2.3, 2.4 and 2.5. The reports include notes that:

- Supplemental investigation for Phases 2.3, 2.4 and 2.5 was undertaken in order to inform the geotechnical design and the remedial strategy.
- Revised remedial strategy is outlined and separately detailed in a CampbellReith Earthworks Specification 2 issued for construction.
- Phases 2.3, 2.4 and 2.5 are being re-engineered such that a proportion of Made Ground (landfill material) is being excavated across the site, where present, and replaced in a controlled manner (based on either the Specification for Highways Work or other CampbellReith Earthworks Specifications). The excavated materials will be sorted prior to reuse as engineered fill, where larger pieces of organic material will be removed by hand.
- Analytical results do not indicate any significant soil contamination and therefore formal soil remediation is not needed.
- Although elevated leachate concentrations have been detected during historical investigations, the risk to surface water receptors from the works is low and specific remedial works in this regard are not required.
- Ground gas conditions are also presented.
- A Materials Management Plan (MMP) will be required to demonstrate that soil is re-used in accordance with waste guidance.

3.2.1.3 Construction environmental management plan

The Construction Environmental Management Plan (CEMP) produced for the Site (CampbellReith 2016c) details:

- Introduction refers to Condition 49 of permission DC/15/2831 (and Conditions 33 and 77).
- CEMP sets out details for the construction environmental management of each part of the development as described in the planning application, including Phase 1 of the residential development and subsequent phases, for which the principles will be developed into respective detailed plans prior to the commencement of each phase for approval by the LPA.
- Paragraphs 5.2 and 9.6 reference a Site Waste Management Plan (SWMP) 4 approved by planning consent DC/10/1612.

3.2.1.4 Earthworks specification

CampbellReith has prepared Earthworks Specification documents for Phase 2.3 (Campbell Reith, 2016d) and Phases 2.4 to 2.6 (CampbellReith, 2017c). These documents contain the site-specific methods to be employed for the earthworks in each stage and reference the use of lime/CKD should for soil moisture conditioning purposes.

Both Earthworks Specification documents (CampbellReith 2016d and 2017c) are provided in Appendices D and E respectively.

3.3 Section 106 Agreements

A S106 agreement is a legal and enforceable agreement between a developer and a local planning authority. These are also known as planning obligations under the Town and Country Planning Act (1990).

The 2016 planning consent (DC/15/2813) is subject to specific agreements under Section 106 (S106) of the Town and Country Planning Act (1990) (Table 3.2). Copies of these S106 agreements, including executed plans, are provided in Appendix F. These agreements place a clear obligation on the developer to complete the development.

Table 3.2 sets out and summarises the S106 Agreements and the specific obligations therein.

Table 3.2 Section 106 agreements

Reference/Date	Comment
28 April 2016: Relating to land to the west of Bewbush (also known as Kilwood Vale) in the District of Horsham West Sussex	<p>Parties include: Crest Nicholson Operations Ltd (CNO); Homes and Communities Agency (HCA); and Horsham District Council (HDC). Agreement notes:</p> <ul style="list-style-type: none"> • Para 1.8: in July 2009, HDC adopted local development framework which allocates the Site for strategic housing and associated development, subject to the requirements to satisfy certain planning obligations arising out of the development. • Para 1.10: details general contributions and land transfers to provide public facilities to benefit the public. • Section 2: Refers specifically to planning applications. • Section 2: Includes executed plans agreed by all parties which include phasing plans. • Includes a series of schedules detailing requirements for: Open Spaces; SUDS; Community Building; Affordable Housing; Employment Land; Retail Land.
28 April 2016: Relating to phased development the west of Bewbush (also known as Kilwood Vale)	<p>Parties include: CNO; HCA; and West Sussex County Council (WSCC). Agreement notes:</p> <ul style="list-style-type: none"> • Also notes that site forms part of the local development framework. • Includes executed plans agreed by all parties which include phasing and master plans. • Agreement focuses on: Transport/Highways; Community buildings; Education buildings.
9 June 2016: Relating to land at Kilwood Vale in the District of Horsham, West Sussex	<p>Parties include: CNO; HCA; and HDC. Agreement focuses specifically on affordable housing provision.</p>

The S106 Agreements provide a legal obligation to deliver the development to the required standard. In order to meet the required standard, the existing material must comply with strict moisture content criteria defined by the Earthworks Specifications, as discussed in Section 3.2.1.4 and presented in Appendices D and E.

3.4 The Recovery Test

ESI considers that, consistent with the EA recovery guidance (Environment Agency, 2016), it can be clearly demonstrated that there is an obligation to provide the housing and community buildings/spaces as required by the three extant S106 Agreements.

Development of the Site to an appropriate standard requires that existing Made Ground on Site will require conditioning to control its moisture content.

The Site is to be developed in phases according to a programme in order that the development may be delivered in a timely manner. Year round working will be required and as such, waiting times due to natural drying of materials is not feasible.

Based on the scale of the development and strict timescales to deliver each phase, the only reasonable method by which the obligations may be met is through the application of lime or CKD.

Should the developer not be permitted to use CKD in the development, lime would be imported instead to ensure timely delivery of the suitably engineered development platform.

The application of lime to soils is an industry standard method of reducing moisture content (BLA, 2017). With consideration for both the scale of the project and sensitivity of the Site, the use of CKD instead of lime would free up lime for use in applications where use of a non-waste material is more important whilst reusing material (CKD) which may otherwise be disposed of by landfill.

ESI considers that this WRP demonstrates that even if waste were not available, the Operator (in this case the Developer) would remain obliged to carry out the moisture content conditioning work through the application of lime, as currently occurring. Therefore, the 'substitution test' can be demonstrated.

3.5 Additional Information - Specific Obligations

Environment Agency guidance (2016) also requires that in the case of a specific obligation(s) to carry out the work, the WRP must also include:

- evidence of the obligation;
- plans and cross sections that show your proposal matches the obligation on you; and
- evidence that the waste is suitable for the intended purpose.

This section provides the information in response to these 'specific obligation' questions.

It is noted that Environment Agency (2016) also requires that:

'You must include certain information in your waste recovery plan unless the Environment Agency agrees that you have specific obligations to carry out the work'.

3.5.1 Evidence of the obligation

It is considered that evidence of the obligation has been fully addressed in preceding Sections, with associated evidence Appended to this WRP.

3.5.2 Waste quantities, plans and cross sections

Given the nature of the waste recovery operation, in that the volume of waste to be used is not possible to define and may vary between areas, it is considered that plans and cross sections for the restoration of the Site are not required in this instance.

The contours and engineering parameters to achieve will be carefully controlled by extant planning permissions DC/10/1612, DC/13/1437 and DC/15/2813.

As the scheme will only be completed in accordance with the planning consents and S106 agreements, the scheme defined in this WRP matches the obligation which has been placed on the Developer.

Laboratory testing has been undertaken on samples of in-situ soils and soils mixed with varying percentage additions of CKD to assess the quantity of CKD required to achieve an optimal target moisture content of 20%.

A series of laboratory testing certificates are provided in Appendix G. A summary of required CKD application rates, based on differing soil moisture content, is presented in Table 3.3.

Table 3.3 CKD application rate table

Starting moisture content (%)	% CKD required
26	6
25	6
24	5
23	4
22	3
21	2

As the starting moisture content of the material may vary it is not possible to accurately estimate the volume of material required to complete the project. Dunton Environmental has however advised ESI that based on current application rates of lime, an application of approximately 900 tonnes of CKD per month (10,800 tonnes per annum) may be anticipated.

As the volume of CKD applied to the existing material directly affects the moisture content, and the moisture content is dictated by the engineering specification (Section 3), it is clear that only the minimum volume of CKD will be used to achieve the requirements of the engineering specification.

3.5.3 Waste suitability

The wastes to be used in the recovery operation are a direct replacement of lime, employed for its moisture conditioning properties.

Full details of waste acceptance and treatment procedures and operator competence will be supplied as part of the Environmental Permit application submission.

It should also be noted that the application for CKD waste to land has been previously accepted by the Environment Agency under the provisions of Standard Rules Permit SR2010No5.

3.5.3.1 Risks to controlled waters

A Hydrological Risk Assessment (HRA) has been completed by (ESI, 2017) and concludes that the CKD does not present an unacceptable risk to the environment. A copy of the HRA is presented in Appendix H.

3.5.3.2 Waste classification

With respect to waste classification (Hazardous or Non-Hazardous) Dunton Environmental has commissioned a series of assessments which are presented in Appendix I which includes the following:

- Laboratory test certificate (QTS Environmental Ltd) dated 25 May 2017 which provides chemical analysis of CKD samples;
- HazWasteOnline Waste Classification Report completed by Dunton Environmental. This report defined the CKD samples as being classified as 'potentially hazardous waste' based on high pH values; and
- In-vitro skin corrosion testing commissioned by Dunton Environmental undertaken by Envigo (2017) which concluded that CKD samples were assessed to be non-corrosive to skin.

Based on the assessments detailed above, and the non-corrosive nature of sampled CKD (Enviro, 2017), it is concluded that that CKD should be considered to be non-hazardous waste and therefore suitable for application as a recovery activity for the purpose and indicated low (<6%) application rates described in this WRP.

4 Conclusions

It is ESI's opinion that based on the requirements of Environment Agency guidance (2016), the extant planning for Kilwood Vale, the S106 Agreements and Earthworks Specifications provide that there is an obligation for soil moisture conditioning at the Site. This is currently being undertaken using lime and the use of CKD will act as a direct substitute for lime, preserving this resource, whilst meeting the requirements of the Engineering Specification.

The quantity of waste to be used will be limited to the minimum required, to achieve the required moisture content of in-Situ soils.

The HRA (ESI, 2017) concludes that the use of CKD in the proposed waste recovery operation would not pose an unacceptable risk to the environment.

The use of CKD to control the moisture content of the soil, rather than spread and dry techniques, will ensure the development can be progressed year-round, with the final development delivered in a timely manner as required by the programme and planning permission.

The use of waste as a replacement for non-waste materials will conserve resources as well as reusing material which may otherwise be disposed of by landfill. This accords with the Environment Agency's 'substitution test' and the Waste Framework Directive's (WFD, 2015) waste hierarchy principle which prioritises the recovery of wastes over disposal.

The development of the Site will provide significant long-term benefits, ensuring that the delivery of this strategically important new development is realised in Crawley, which aligns with national Government policy for housing provision, urban regeneration and brownfield redevelopment.

It is in the interest of all stakeholders that the works are undertaken to the highest standard and to the satisfaction of both the Environment Agency and relevant local authorities. These high standards are also necessary to ensure the long term commercial viability of the scheme for the Developer and the provision of this extensive development.

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- WFD, (2015).** The Waste Framework Directive (Standards and Classification) Directions (England and Wales), 2015.

APPENDICES

Appendix A

Planning decision notice DC/10/1612 (17 October 2011)



**Horsham
District
Council**

serving our towns and villages

**Park North, North Street, Horsham,
West Sussex, RH12 1RL**

Tel: (01403) 215100 Fax: (01403) 215198
(Calls may be recorded)

website: www.horsham.gov.uk

e-mail: planning@horsham.gov.uk

Mr Jonathan Steele
Savills Planning and Regeneration
Brunswick House
Brunswick Place
Southampton
Hampshire
SO15 2AP

Application Number: DC/10/1612

TOWN AND COUNTRY PLANNING ACT, 1990
TOWN AND COUNTRY PLANNING (GENERAL DEVELOPMENT PROCEDURE) ORDER 1995

On behalf of: Crest Strategic Projects Ltd

In pursuance of their powers under the above-mentioned Act and Order, the Council hereby notify you that they PERMIT the following development, that is to say:

Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space. Full planning permission for engineering operations associated with landfill remediation and associated infrastructure including pumping station. Full permission for the development of Phase 1 of 291 dwellings, internal roads, garages, driveways, 672 parking spaces, pathways, sub-station, floor attenuation ponds and associated amenity space. Full permission for the construction of a 3 to 6 metre high (above ground level) noise attenuation landform for approximately 700 metres, associated landscaping, pedestrian/cycleway and service provision (land known as Kilnwood Vale)

Holmbush Farm Landfill Site Crawley Road Faygate West Sussex

to be carried out in accordance with Application No. DC/10/1612 (as modified by the under-mentioned conditions, if any) submitted to the Council on 30/07/2010 and subject to compliance with the plans/documents and conditions specified hereunder.

ROD BROWN
HEAD OF PLANNING
AND ENVIRONMENTAL SERVICES

Date: 17/10/2011

Part A: Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre

and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space.

- 1 Applications for the approval of reserved matters shall be made to the Local Planning Authority before the expiration of 12 years from the date of this permission.

Reason: To comply with Section 92 of the Town and Country Planning Act 1990.

- 2 The development hereby permitted shall begin either before the expiration of five years from the date of this permission or before the expiration of two years from the date of the approval of the last of the reserved matters to be approved, whichever ever is the later.

Reason: To comply with Section 92 of the Town and Country Planning Act 1990.

- 3 The submission of reserved matters applications pursuant to this outline application shall demonstrate substantial compliance with the following parameter plans submitted as part of the Outline application to fix the development principles:-

Land Use Plan Fig 15.1

Density Plan Fig 15.2

Buildings Height Plan Fig 16.1

Pedestrian & Cycle Movement Plan Fig 17.1

Vehicular Movement Plan Fig 17.3

Landscape and Open Space Plan Fig 18.1

Reason: To enable the Local Planning Authority to control the development in detail and to ensure compliance with the Land West of Bewbush Joint Area Action Plan throughout the phased development of the applications site.

- 4 The phasing of the development hereby permitted shall be in substantial accordance with the phasing and order shown in Figure 24.1 of the submitted Design and Access Statement unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the delivery of the development and the associated infrastructure as required by the Land West of Bewbush Joint Area Action Plan.

- 5 Approval of the details of the layout of the development, the scale of each building, the appearance of each building, access to and within the site and the landscaping of the development (hereinafter called "the reserved matters") shall be obtained from the Local Planning Authority in writing before the relevant phase or part phase of the development is commenced, other than the Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application. The development shall be carried out in accordance with the approved details.

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990.

- 6 Plans and particulars submitted pursuant to condition 5, (except where already provided in connection with Phase 1), above shall include the following details:

- i) any proposed access road(s) including details of horizontal and vertical alignment;

- ii) the layout, specification and construction programme for (1) any internal roads not covered by (i) above, (2) footpaths, (3) parking and turning areas (including visibility splays) (4) cycle parking areas and (5) cycle storage facilities;
- iii) The reserved matters application for landscaping referred to in condition (5) above shall include the following information:
 - Location of existing trees, hedges, shrubs and other vegetation.
 - The layout, character, structure and types of the proposed planting, together with an indicative schedule of planting species.
 - The layout and character of the proposed hardsurfacing areas together with an indicative schedule of materials
 - Details of any earthworks proposed, contours to be formed and representative cross/long-sections and
- iii) Location of lighting for roads, footpaths and other areas.

The reserved matters for landscaping details shall show integration with the other reserved matters.

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990

- 7 Notwithstanding the details as set out in the submitted Design and Access Statement dated July 2010 and the Design and Access Statement Supplementary Information dated February 2011, a Design Brief for the Neighbourhood Centre, Station Square and Brook Crossing areas as shown in Figure 18.15 of the Design and Access Statement shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of Phase 3, other than remediation soil testing site clearance and earthworks approved as part of this application.

The detailed design principles within the Design Brief shall include:

- Constraints
- Topography
- Landuse
- Massing and building heights
- Access and circulation
- Parking
- Public realm
- Layout
- Appearance
- Phasing
- A 3 dimensional spatial masterplan
- Architectural, landscape and sustainable construction guidelines

The reserved matters applications pursuant to this permission shall demonstrate compliance with the Design Brief and shall reflect the visions of the submitted Design and Access Statement (including the Supplementary information dated February 2011) and Landscape Strategy for the development. The development shall be carried out in accordance with the approved Design Brief.

Reason: To enable the Local Planning Authority to control the development in detail and to ensure compliance with the Land West of Bewbush Joint Area Action Plan throughout the phased development of the applications site.

- 8** Each phase or part phase of the development (excluding phase 1) shall be accompanied by a statement of conformity with evidence to demonstrate that the design of the development is in substantial accordance with the vision/design principles/details of the Design and Access Statement (including the Supplementary information dated February 2011); the Kilnwood Vale Open Space Strategy dated July 2010, the Strategic Design Code and the Design Brief approved by condition 7.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 9** Plans showing the structure and layout for each of the key open spaces within the development) which are identified on plan No.0404.00027.16.GA.210 Revision D (excluding open space within phase 1) shall be submitted concurrently with the reserved matters for each phase or part phase in which the open spaces are located and approved in writing by the Local Planning Authority.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 10** For each phase or part phase of the development the key open spaces as identified on plan No.0404.00027.16.GA.210 Revision D (excluding open space within phase 1) shall be laid out in accordance with the structure and layout approved by condition 9, and the structure, layout, facilities and equipment shall be provided in accordance with a timetable which shall be submitted to and approved in writing by the local planning authority prior to the commencement of the relevant phase or part phase, other than remediation soil testing site clearance and earthworks and any related operations approved as part of this application. The development shall be carried out in accordance with the approved details and timetable.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 11** A scoping document in the form of an overarching long term Landscape Management and Maintenance Plan for the whole development site shall be submitted to the local planning authority within 6 months of the commencement of the development. The plan shall be approved in writing by the Local Planning Authority.

The plan shall include:

- Aims and Objectives
- A description of hard and soft landscape features, habitats and species
- An outline of the proposed key management and maintenance operations
- Information on the Quality Standards to be used

The plan shall demonstrate full integration of landscape, ecological, arboricultural and woodland management considerations.

The areas and features that shall be covered by the management and maintenance plan shall include :

- i) Structural Landscaping and buffer strips
- ii) Highways, Highway verges, Footpaths and Cyclepaths, Street Furniture and Street lighting
- iii) Parking courts/ carparks, Amenity Areas around flats
- iv) Phase 1 Neighbourhood Park
- v) The Knoll Neighbourhood Park
- vi) Kilnwood Vale Neighbourhood Park
- vii) The Viewpoint Neighbourhood Park
- viii) Kilnwood Community Green
- ix) Gateway Village Green including the A264 buffer
- x) Western Greenway
- xi) Eastern Greenway
- xii) Central Greenway
- xiii) Bewbush Brook and general amenity greenspace
- xiv) Green corridors north of the railway
- xv) Pondtail shaw and Capon Grove woodlands
- xvi) Other incidental areas of open space
- xvii) Sustainable Urban Drainage Features

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 12 Prior to the occupation of any dwellings on each phase or part phase, a detailed management and maintenance plan, for areas of land within that phase or part phase, shall be submitted to and approved in writing by the Local Planning Authority clearly setting out future maintenance responsibilities for all areas of land within that phase or part phase. Each detailed management and maintenance plan shall be incorporated into, and demonstrate integration with the overarching Landscape Management and Maintenance Plan approved by condition 11 above, and shall include:

- Detailed Management and Maintenance Prescriptions/Operations
- Schedules of maintenance operations and their timing
- A plan showing parties responsible for the maintenance of different areas and their contact details.

Each phase or part phase of the development shall thereafter be maintained in accordance with the approved Landscape Management and Maintenance plan, unless otherwise approved in writing by the Local Planning Authority.

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 13 Within 12 months of the commencement of development, unless otherwise agreed in writing by the Local Planning Authority, on the areas shown red and yellow on hybrid planning application component plan no.248 Revision F, a detailed management and maintenance plan for these areas shall be submitted to and approved in writing by the Local Planning Authority clearly setting out future maintenance responsibilities. The

detailed management and maintenance plan shall be incorporated into, and demonstrate integration with the overarching Landscape Management and Maintenance Plan approved by condition 11 above, and shall include:

- Detailed Management and Maintenance Prescriptions/Operations
- Schedules of maintenance operations and their timing
- A plan showing parties responsible for the maintenance of different areas and their contact details.

The areas shown red and yellow on hybrid planning application component plan no.248 Revision F Shall thereafter be maintained in accordance with the approved Landscape Management and Maintenance plan, unless otherwise approved in writing by the Local Planning Authority.

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 14 The detailed landscape scheme for a) the A264 landscape buffer b) the A264 highway access and c) the Phase 1 residential development shall be approved in writing by the local planning authority, in consultation with West Sussex County Council with regard to parts a) and b). The scheme shall be implemented in accordance with details and a timetable which shall be agreed in writing by the Local Planning Authority. The details and timetable shall be submitted to the Local Planning Authority within 6 months of the commencement of development.
Please refer to informative 20.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 15 No development of any phase or part phase shall begin, or such other date or stage in development as may be agreed in writing with the LPA, other than remediation soil testing site clearance and earthworks approved as part of this application, until a scheme for the provision and management of a buffer zone of at least 5 metres other than at pinch points alongside the watercourses shall be submitted to and agreed in writing by the LPA. The buffer zone shall be clear of all buildings, structures, fences etc and hard standing, including formal footpaths and cycle paths. Thereafter the development shall be carried out in accordance with the approved scheme and any subsequent amendments shall be agreed in writing with the LPA. The scheme shall include:

- Implementation Plan
- plans showing the extent and layout of the buffer zone, identifying the exact location of pinch points within the buffer zones (and the justifications for these), the design, widths, surface types and distances from the edges of the paths to the top of the banks, of all footpaths and cycle paths adjacent to watercourse
- details of the planting scheme (for example, native species)
- details demonstrating how the buffer zone will be protected during development and managed/maintained over the longer term

Reason: Development that encroaches on watercourses has a potentially severe impact on their ecological value. This is contrary to government policy in PPS1 -"Delivering Sustainable Development" PPS9 and to the UK Biodiversity Action Plan (UK BAP). Land

alongside watercourses is particularly valuable for wildlife and it is essential this is protected. Article 10 of the Habitats Directive also stresses the importance of natural networks of linked corridors to allow movement of species between suitable habitats, and promote the expansion of biodiversity. Such networks may also help wildlife adapt to climate change.

This planning condition is necessary to ensure the development complies with the principles of PPS1, PPS9 and UK BAP.

- 16 No development (or such other date or stage in development as may be agreed in writing with the LPA), excluding Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application, shall take place until a scheme for the provision and management of compensatory habitat creation has been submitted to and agreed in writing by the LPA and implemented as approved. Thereafter the development shall be implemented in accordance with the approved scheme.

Reason: Development that encroaches on watercourses and wetland has a potentially severe impact on its ecological value. PPS9 states that where proposed development would cause significant adverse impacts on biodiversity interests, which cannot be prevented or adequately mitigated against, appropriate compensatory measures should be sought.

This planning condition is necessary to ensure the development complies with the principles of PPS9.

- 17 No phase or part phase of the development shall commence until all existing trees/bushes/hedges to be retained within (and immediately adjacent to) that phase or part phase as approved pursuant to condition 5 above, have been protected by a fence erected in accordance with the guidance contained in BS 5837:2005 and maintained during the course of development within that phase or part phase. Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the local planning authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: In order to adequate protection to existing trees and hedges prior to the development of the site in accordance with Policy DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 18 No trees, hedges or shrubs on the site, shall be wilfully damaged or uprooted, felled/removed, topped or lopped (without the previous written consent of the Local Planning Authority) until 5 years after completion of any phase or part phase of the development hereby permitted. Any trees, hedges or shrubs on the site, whether within the tree protective areas or not, which die or become damaged during the construction process shall be replaced with trees, hedging plants or shrubs of a type, size and in positions agreed by the Local Planning Authority.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 19 Any plants which within a period of 5 years die, are removed, or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size and species unless the Local Planning Authority gives written consent to any variation.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 20 No development or preparatory works within 15m of the Ancient Woodland in Pondtail Shaw shall begin until a methodology has been submitted to and approved in writing by the Local Planning Authority to support the detailed applications detailing how the ancient woodland will be protected during the construction of the CHP plant, western bridge crossing and any other development within 15m. The development shall be carried out in accordance with the approved details.

Reason: To protect ancient woodland in accordance with HDC Policies CP1 and DC5, PPS 9 paragraphs 10, 12 and 14 and Section 40 of the Natural Environment and Rural Communities Act 2006.

- 21 a) Within 6 months of the commencement of the development a scoping document in the form of an overarching long term Ecological Management Plan in respect of all the land within the red line as shown on the Masterplan (including the details submitted as part of phase 1) shall have been submitted to the local planning authority in writing. The Ecological Management Plan shall be based upon the mitigation and measures contained within Chapter 10 of the Environmental Statement dated July 2010.

b) A detailed Ecological Management plan shall be submitted as part of each reserved matters application and approved in writing by the Local Planning Authority and shall be incorporated into, and demonstrate integration with, the overarching Ecological Management Plan together with demonstrating compliance with the ecological mitigation set out in Chapter 10 of the Environmental Statement.

Each phase or part phase of the development shall thereafter be maintained in accordance with the approved overarching and detailed Ecological Management plan, unless otherwise approved in writing by the LPA.

Reason: To accord with the Design and Access Statement and PPS 9 and the Natural Environment and Rural Communities Act 2006.

- 22 No earthworks or recontouring associated with any phase or sub-phase shall begin until a scheme for the temporary drainage of that particular phase or sub-phase has been submitted to and approved in writing by the Local Planning Authority (LPA). The scheme shall subsequently be implemented in accordance with the approved details/timing embodied within the scheme and any subsequent amendments shall be agreed in writing with the LPA.

The scheme shall also include:

- demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
- measures to mitigate any increased risk of sediment entering the watercourses

Reason: To prevent the increased risk of flooding; to protect water quality. This planning condition is necessary to ensure the development complies with the principles of PPS25 and PPS9.

- 23 No physical works affecting a watercourse within any phase or part phase shall begin until, a working method statement to cover all channel / bank works (to include realignment or culverting) of any watercourses shall be submitted to and agreed in writing by the LPA. Thereafter the development shall be carried out in accordance with the approved scheme and any subsequent amendments shall be agreed in writing with the Local Planning Authority.

The scheme shall also include:

- demonstration that there will not be a detrimental impact upon flood risk or the geomorphology of the watercourse.

Reason: To prevent a detrimental change in the flow conveyance of the watercourse, or increased risk of blockage which could lead to an increased risk of flooding and also to prevent an adverse impact upon the wildlife habitat. This planning condition is necessary to ensure the development complies with the principles of PPS25 and PPS9.

- 24 There shall be no raising of ground levels within the one per cent annual probability (1 in 100 year) flood extent, taking into account a suitable allowance for the potential impacts of climate change, without the prior written approval of the LPA.

Reason: To prevent an increase in the impact of flooding through a reduction in the floodwater storage capacity, or flow conveyance of the floodplain in accordance with PPS25 and Policy DC7 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 25 At the Reserved Matters stage for any phase or part phase (excluding phase 1) a drainage strategy detailing any on and/or off site foul drainage works for that phase or part phase, shall be submitted to and approved in writing by the local planning authority in consultation with the sewerage undertaker. No discharge of foul water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed. The development shall be carried out in accordance with the approved details.

Reason: The development may lead to sewage flooding; to ensure that sufficient capacity is made available to cope with the new development; and in order to avoid adverse environmental impact upon the community in accordance with PPS25 and Policy DC7 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 26 Construction of the development shall not commence on any phase or part phase (other than remediation soil testing site clearance and earthworks approved as part of this application) until details of the proposed potable water infrastructure plans for that phase or

part phase have been submitted to, and approved in writing by, the Local Planning Authority. The development shall be completed in accordance with the approved plans.

Reason: To ensure that the existing infrastructure meets the needs of the development in accordance with Policies CP13 and DC9 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 27 At the Reserved Matters stage for any phase or part phase excluding phase 1, a surface water drainage strategy for that phase or part phase based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the whole development, should be submitted to and approved in writing by the LPA.

The strategy shall also include:

- Details of how the sustainable drainage management train will be incorporated including a number of water treatment stages
- Details of how the drainage from the phase or part phase will discharge into the watercourse as proposed in section 5.3 of the approved Flood Risk Assessment (FRA) dated July 2010 (SLR Ref: 403-00404-00027).
- Consideration of pollution prevention measures to protect watercourses and groundwater
- Confirmation that there will be no discharge to ground in areas affected by contamination
- Demonstration that the scheme complies with Advice Note 6 ' Potential Bird Hazards from Sustainable Urban Drainage Schemes (SUDS).
- Demonstration that flows through railway culverts will be restricted to pre-development rates or less.

The development shall be carried out in accordance with the details and any timings of the approved scheme. Any subsequent amendments shall be agreed in writing with the Local Planning Authority.

Reason: To prevent the increased risk of flooding, and ensure a management train is incorporated as agreed to improve and protect water quality, improve habitat and amenity, and ensure future maintenance of the drainage system. It is important that this is provided at the reserved matters stage to ensure that surface water drainage is considered strategically at a time that will inform the master-planning of the phase.

This planning condition is necessary to ensure the development complies with the principles of PPS25, PPS23 and PPS9.

- 28 No development of any phase or part phase excluding phase 1 shall begin, or such other date or stage in development as may be agreed in writing with the LPA, other than remediation soil testing site clearance and earthworks and any related operations approved as part of this application, until the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the LPA

1) A preliminary risk assessment which has identified:

- all previous uses
- potential contaminants associated with those uses

- a conceptual model of the site indicating sources, pathways and receptors
 - potentially unacceptable risks arising from contamination at the site.
- 2) A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.
 - 3) The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.
 - 4) A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be submitted to, and approved, in writing, by the LPA. This shall include measures to deal with any contamination not previously identified but subsequently found to be present at the site.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed

This planning condition is necessary to ensure the development complies with the principles of PPS23.

- 29 No occupation of any phase or part phase of the permitted development shall occur until a verification report demonstrating completion of the remediation works set out in the approved remediation strategy, and the effectiveness of the remediation for that phase or sub-phase shall be submitted to and approved, in writing, by the LPA. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the LPA. The long-term monitoring and maintenance plan shall be implemented as approved.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed.

This planning condition is necessary to ensure the development complies with the principles of PPS23.

- 30 Piling or any other foundation designs using penetrative methods shall not be permitted other than with the express written consent of the LPA, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to groundwater.

Reason: Piling or other sources of ground penetration could create a pathway for contaminants to migrate into the groundwater. Preventative measures should be taken in order to protect groundwater quality. We recommend that where soil contamination is

present a risk assessment is carried out as per our guidance 'Piling into Contaminated Sites.

This planning condition is necessary to ensure the development complies with the principles of PPS23.

31 No development on a phase or part phase shall commence (unless otherwise approved in writing by the LPA in consultation with the County Archaeologist) until a programme of archaeological work including a Written Scheme of Investigation for that phase or sub phase has been submitted to and approved by the local planning authority in writing. The scheme shall include research questions; and

1. The programme and methodology of site investigation and recording
2. The programme for post investigation assessment
3. Provision to be made for analysis of the archaeological archive arising from the site investigation and recording
4. Provision to be made for publication and dissemination of the findings of the site investigation and recording
5. Provision to be made for compilation and appropriate conservation of the archaeological site archive and insofar as may be reasonably practicable its deposition in an appropriate museum or publicly accessible repository
6. Nomination of a competent person or persons or organisation to undertake the works set out within the Written Scheme of Investigation.

No development shall take place other than in accordance with the approved Written Scheme of Investigation.

Reason: In order to ensure that archaeological features on the site will be properly recorded before and during development and that the records will be satisfactorily reported in accordance with Policy DC10 of the Horsham District Local Development Framework, General Development Control Policies 2007.

32 No dwellings shall be constructed north of the railway line until the bridge over the railway, as illustrated on the parameter plans approved as part of this application, has been constructed. Details of the bridge shall be submitted to and approved in writing as part of a reserved matters application and the bridge shall be constructed in accordance with the approved details.

Reason: To ensure the delivery of a high quality accessible and integrated development as required by the Land West of Bewbush Joint Area Action Plan.

33 Prior to the commencement of each Phase or part Phase of the development (including phase 1) a construction environmental management plan (CEMP) for that Phase or part Phase shall be submitted to the Local Planning Authority for its written approval and thereafter implemented and maintained throughout the construction period in accordance with the approved CEMP. The CEMP shall include:

- Details of the working hours agreed with the Local Planning Authority for the implementation of the development;
- Details of the design and location of the construction access;
- Details of proposed wheel washing facilities located adjacent the construction site access;

- Details of an area for the storage of materials, parking for construction traffic and an appropriate turning area has been provided within the site clear of the public highway;
- A site waste management plan
- Details of temporary utilities
- How the construction will comply with the sustainable use of soils on construction sites.
- Details of a communication strategy to include the provision of a dedicated phone line for residents to contact the site manager directly with complaints which should be manned at all times while site works are in progress.
- Details of a routing agreement for the site construction traffic and HGV traffic associated with the movement of bulk material to and from the site;
- Details of means of suppressing dust during the construction process to include the regime for dust deposition measurement at the site boundaries;
- Details of the measures to mitigate the noise and vibration from construction including those measures identified in sections 13.5.1 to 13.5.4 of the Environmental Statement;
- Details of a surface water drainage scheme for the temporary drainage of the Site. The scheme shall subsequently be implemented in accordance with the approved details. The scheme shall include:
 - demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
 - measures to mitigate any increased risk of sediment entering the watercourses and groundwater.
 - demonstration that there will be no discharge to ground that has been affected by contamination
- Measures for tree and hedgerow protection throughout the development programme;
- A detailed method statement for the removal or long-term management/eradication of Japanese Knotweed on the site. The method statement shall include proposed measures to prevent the spread of Japanese Knotweed during any operations such as mowing, strimming or soil movement. It shall also contain measures to ensure that any soils brought to the site are free of the seeds/root/stem of any invasive plant covered under the Wildlife and Countryside Act 1981.
- A detailed method statement for the construction of bridges to be submitted within the CEMP prior to the commencement of the relevant phase or sub-phase.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with Policies DC5, DC7, DC9 and DC40 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 34** No dwelling within any phase or part phase of the development shall be occupied unless and until it has been provided with satisfactory parking arrangements in accordance with plans to be submitted and approved. The development shall be carried out in accordance with the approved details.

Reason: To prevent random parking taking place within the development in accordance with Policies DC9 and DC40 of the Horsham District Local Development Framework, General Development Control Policies 2007.

35 The proposed bus gate links from the development to Sullivan Drive and Woodcroft Road as illustrated on Figure 17.3 shall be designed, laid out and constructed in all respects to a specification (which shall include safety audits and demonstration of the connectivity with the adjoining highway) to be submitted to and agreed by the LPA.

a) The bus gate between the development and Sullivan Drive shall be provided by the occupation of the 900th dwelling and completed in accordance with the approved scheme.

b) The bus gate between the development and Woodcroft Road shall be provided by the occupation of the 1,650th dwelling and completed in accordance with the approved scheme.

Reason: In the interests of highway safety and to ensure the delivery of a high quality accessible and integrated development with pedestrian and public transport links in accordance with Policies CP13, DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

36 No more than 350 of the dwellings hereby permitted shall be occupied until the completion of: the improvements to Junction 11 of the M23 shown on drawing number 16702-010-112C; or such other scheme of works to the highway substantially to the same effect, as may be approved in writing by the local planning authority (who shall consult with the Highways Agency on behalf of the Secretary of State for Transport).

Reason: To ensure that the M23 Motorway and the A23 Trunk Road continue to be an effective part of the national system of routes for through traffic in accordance with section 10 of the Highways Act 1980 and to satisfy the reasonable requirements of road safety in accordance with PPG13.

37 No more than 800 dwellings hereby permitted shall be occupied until the completion of the improvements to Junction 11 of the M23 shown on drawing number 16702-010-111D; or such other scheme of works to the highway substantially to the same effect as may be approved in writing by the local planning authority (who shall consult with the Highways Agency on behalf of the Secretary of State for Transport).

Reason: To ensure that the M23 Motorway and the A23 Trunk Road continue to be an effective part of the national system of routes for through traffic in accordance with section 10 of the Highways Act 1980 and to satisfy the reasonable requirements of road safety in accordance with PPG13.

38 No dwelling shall be constructed within any Phase or Part Phase of the development until a design assessment in respect of that dwelling has been submitted to and approved in writing by the Local Planning Authority. The assessment shall demonstrate the basis upon which the dwelling shall achieve at least Level 3 of the Code for Sustainable Homes or any other higher code level (or equivalent) required by national legislation as appropriate during the lifetime of the construction of the development. The design assessment shall include a water reduction strategy and shall demonstrate compliance with the Sustainability Statement submitted as part of this application. Each dwelling shall be constructed in accordance with the approved design assessment which relates to that dwelling. Unless otherwise approved in writing by the local planning authority, no dwelling hereby permitted shall be occupied unless a final Code Certificate certifying that at least Code Level 3 has

been achieved (or the level required by national legislation at the time of construction), in respect of that dwelling, has been submitted to the local planning authority.

Reason: To secure the construction of sustainable homes in line with code level requirements at the time of construction in accordance with the vision as set out in the Land West of Bewbush Joint Area Action Plan.

- 39 Before the construction of any non-residential building hereby permitted is commenced a scheme for the achievement of a “very good” rating pursuant to the Building Research Establishment Environmental Assessment Method, in respect of that building, shall have been submitted to and approved in writing by the local planning authority. The scheme shall include a water reduction strategy and shall demonstrate compliance with the Sustainability Statement submitted as part of this application. Each non-residential building shall be constructed in accordance with the approved design assessment which relates to that building. Unless otherwise approved in writing by the local planning authority, no part of any non-residential building hereby permitted shall be occupied until a copy of a post - construction completion certificate, verifying that the building has achieved a “very good” rating, has been submitted to the local planning authority.

Reason: To secure the construction of sustainable development in accordance with the vision as set out in the Land West of Bewbush Joint Area Action Plan.

- 40 The reserved matters application containing the Energy Centre area shall demonstrate that the plant meets BS4142 criteria of a rating level 10dB or more below background at the nearest dwelling, unless otherwise agreed in writing due to changing technology at the time.

Reason: To safeguard the amenities of future residents in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 41 No development shall begin on any phase or part phase, or such other date or stage in development as may be agreed in writing with the LPA, other than remediation soil testing site clearance and earthworks approved as part of this application, until a scheme of sound insulation works to provide sound attenuation against external noise to comply with the 'good' design range of 30 dB LAeq,T for indoor ambient noise levels as stated within BS 8233:1999 for that particular phase has been submitted to and approved in writing by the local planning authority . The scheme as approved by the local planning authority shall be fully installed prior to first occupation of each dwelling.

Reason: To safeguard the amenities of future residents in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 42 Prior to the occupation of any dwelling approved by this consent within or partly within the areas marked in yellow on Drawing Numbers 16702/SK003 and 16702/SK005, a bund shall be constructed in accordance with the approved verified design as shown in Drawing 16702-441-015 for dwellings west of the secondary access and Drawing 16702-441-016A for dwellings east of the secondary access.

Reason: To ensure that ambient noise levels are acceptable for those dwellings that without the bund in place would be likely to be subjected to unacceptable noise levels in

accordance with PPG24 and Policy DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 43 No development, excluding Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application, shall begin on any phase or part phase until full details of soft and water landscaping works have been submitted to and approved in writing by the Local Planning Authority, details must comply with Advice Note 3, 'Potential Bird Hazards from Amenity Landscaping and Building Design available at www.aoa.org.uk/publications/safeguarding.asp. These details shall include:

- Any earthworks
- Grassed areas
- The species, number and spacing of trees and shrubs
- Details of any water features
- Drainage details including SuD;s - such schemes must comply with Advice Note 'Potential Bird Hazards from Sustainable Urban Drainage Systems (SuD's) available at www.aoa.org.uk/publications/safeguarding.asp

No subsequent alterations to the approved landscaping scheme are to take place unless submitted to and approved in writing by the Local Planning Authority. The scheme shall be implemented as approved.

Reason: To avoid endangering the safe movement of aircraft and the operation of Gatwick Airport through the attraction of birds and an increase in the bird hazard risk of the application site.

- 44 Before the construction of the first water body begins a Bird Hazard Management Plan that relates to all the water bodies must be submitted to and approved in writing by the Local Planning Authority. The submitted plan shall include details of:

- Assurances that no Feral or Canada Geese will be allowed to breed on the site.
- That regular inspection will be carried out during the breeding season and what dispersal action will be taken.

The Bird Management Plan shall be implemented as approved on completion of the first water body and shall remain in force for the life of those water bodies. No subsequent alterations to the plan are to take place unless first submitted to and approved in writing by the Local Planning Authority.

Reason: It is necessary to manage the water bodies in order to minimise their attractiveness to birds which could endanger the safe movement of aircraft and the operation of Gatwick Airport.

- 45 All landscaping works, including SuD's details shall be carried out in accordance with the approved scheme. No alterations to the approved landscaping scheme are to take place unless submitted to and approved in writing by the Local Planning Authority.

Reason: The scheme has been designed to mitigate bird hazard and avoid endangering the safe movements of aircraft and the operation of Gatwick Airport through the attraction of birds.

46 Lighting schemes required during the construction and for the completed development shall be of a flat glass, full cut off design, mounted horizontally, and shall ensure that there is no light spill above the horizontal.

Reason: To avoid endangering the safe operation of aircraft through confusion with aeronautical ground lights or glare.

47 Unless otherwise agreed in writing by the Local Planning Authority in agreement with Gatwick Airport no buildings or structures associated with the development hereby permitted shall exceed the heights as shown on plan LGW1924 in metres Above Ordnance Datum AOD.

Reason: Development exceeding this height would penetrate the Obstacle Limitation Surfaces (OLS) surrounding Gatwick Airport and endanger aircraft movements and the safe operation of the aerodrome See Advice Note 1 'Safeguarding an overview ' for further information (available at www.aoa.org.uk/publications/safeguarding.asp).

Part B: Full planning permission for engineering operations associated with landfill remediation and associated infrastructure including pumping station.

48 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

49 Prior to the commencement of part b) of the development a construction environmental management plan (CEMP) for the works associated with part b) shall be submitted to the Local Planning Authority for its written approval and thereafter implemented and maintained throughout the construction period in accordance with the approved CEMP. The CEMP shall include:

- Details of the working hours agreed with the LPA for the implementation of the development;
- Details of the design and location of the construction access;
- Details of proposed wheel washing facilities located adjacent the construction site access;
- Details of an area for the storage of materials, parking for construction traffic and an appropriate turning area has been provided within the site clear of the public highway;
- A site waste management plan
- Details of any temporary utilities required
- How the construction will comply with the sustainable use of soils on construction sites.
- Details of a communication strategy to include the provision of a dedicated phone line for residents to contact the site manager directly with complaints which should be manned at all times while site works are in progress.
- Details of a routing agreement for the site construction traffic and HGV traffic associated with the movement of bulk material to and from the site;
- Details of means of suppressing dust during the construction process to include the regime for dust deposition measurement at the site boundaries;
- Details of the measures to mitigate the noise and vibration from construction including those measures identified in sections 13.5.1 to 13.5.4 of the Environmental Statement;

- Details of a surface water drainage scheme for the temporary drainage of the Site. The scheme shall subsequently be implemented in accordance with the approved details. The scheme shall include:
 - demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
 - measures to mitigate any increased risk of sediment entering the watercourses and groundwater.
 - demonstration that there will be no discharge to ground that has been affected by contamination
- Measures for tree and hedgerow protection throughout the development programme;
- A detailed method statement for the removal or long-term management/eradication of Japanese Knotweed on the site. The method statement shall include proposed measures to prevent the spread of Japanese Knotweed during any operations such as mowing, strimming or soil movement. It shall also contain measures to ensure that any soils brought to the site are free of the seeds/root/stem of any invasive plant covered under the Wildlife and Countryside Act 1981.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with Policies DC5, DC7, DC9 and DC40 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 50 No development shall commence on part b) of the development until all existing trees/bushes/hedges to be retained within (and immediately adjacent to) any areas of works, have been protected by a fence erected in accordance with the guidance contained in BS 5837:2005 and maintained during the course of development for part b). Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the local planning authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 51 A detailed scheme for temporary hydroseeding of the Knoll shall be submitted to and approved in writing by the local planning authority prior to the commencement of the earthworks operations that will form the basic landform of the Knoll. The approved scheme shall then be implemented according to an agreed timescale to be submitted to and approved in writing with the Local Planning Authority.

Reason: To ensure no erosion of the Knoll feature occurs before the precise final landform details for the Knoll are agreed as part of a future reserved matters submission and implemented in accordance with Policies DC2 and DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

Part C: Full permission for the development of Phase 1 of 291 dwellings, internal roads, garages, driveways 757 parking spaces, pathways, sub-station, flood attenuation ponds and associated amenity space.

52 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

53 Notwithstanding the details submitted as part of the application the construction of buildings and permanent hardsurfacing shall not begin unless and until a schedule of materials and samples of such materials and finishes and colours to be used for a) external walls b) roofs of the proposed building(s) and c) permanent hardsurfacing have been submitted to and approved by the Local Planning Authority in writing and all materials used shall conform to those approved.

Reason: To enable the Local Planning Authority to control the development in detail in the interests of amenity by endeavouring to achieve a building of visual quality in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

54 Details of external walls and/or fences shall be submitted to and approved in writing by the Local Planning Authority and no dwellings/buildings shall be occupied until such walls and/or fences associated with them have been erected. Thereafter the walls and/or fences shall be retained as approved and maintained in accordance with the approved details.

Reason: In the interests of amenity in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

55 Notwithstanding the details submitted the dwelling(s) / building(s) hereby permitted shall not be occupied unless and until provision for the storage of refuse/recycling bins has been made within the site in accordance with details to be submitted to and approved in writing by the local planning authority.

Reason: To ensure the adequate provision of recycling facilities in accordance with policy CP2 of the Horsham District Local Development Framework: Core Strategy (2007).

56 Within 6 months of the commencement of the development a full timetable of implementation and details shall be submitted to and approved in writing of the following:

- a) details of street furniture
- b) details of lighting

The approved scheme shall be implemented in accordance with the approved details and timetable.

Reason: In the interests of amenity in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 57 a) No works or development shall take place (other than remediation soil testing site clearance and earthworks approved as part of this application) until full details of underground services - locations, dimensions, depths have been submitted to and approved by the local planning authority. These details shall demonstrate effective coordination with the detailed landscape proposals submitted pursuant to Condition 13 and 52 above.
- b) The scheme shall ensure that no trenches or pipe runs for services, drains, or any other reason, shall be excavated anywhere within the root protection area of any tree or hedge targeted for retention on or off the site without the prior written approval of the Local Planning Authority.

The underground services shall be installed in accordance with the approved details.

Reason: To ensure the underground services do not conflict with satisfactory development in the interests of amenity and to protect roots of important trees and hedgerows on the site in accordance with Policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 58 Finished floor levels for Phase 1 shall be constructed in accordance with plan no: 16702/441/PA/11 Revision B unless otherwise agreed in writing by the Local Planning Authority.

Reason: To reduce the risk of internal flooding to the development from any localised incidents on the watercourses on-site and in the interests of amenity and in accordance with Policy DC9.

This planning condition is necessary to ensure the development complies with the principles PPS25.

- 59 The Community Green (Gateway Village Green – Phase 1) shall be laid out and ready for use, in accordance with a scheme which shall have been previously been submitted to and approved in writing by the Local Planning Authority. The approved scheme shall include full details of the design, layout, appearance, hard and soft landscape, boundary treatments, street furniture and lighting. The Community Green (Gateway Village Green) shall be provided in accordance with the approved details prior to the first occupation of no more than 25% of the dwellings in that phase.

Reason: To ensure the provision of open space to meet the needs of the development in accordance with an approved scheme in accordance with PPG17 and Policies CP14 and DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 60 The Neighbourhood Park (Phase 1) shall be laid out and ready for use, in accordance with a scheme which shall have been previously been submitted to and approved in writing by the Local Planning Authority. The approved scheme shall include full details of the design, layout, appearance, hard and soft landscape, boundary treatments, street furniture, lighting as well as the play and sports facilities. The Neighbourhood Park (Phase 1) shall be provided in accordance with the approved details prior to the first occupation of no more than 60% of the dwellings in that phase.

Reason: To ensure the provision of open space to meet the needs of the development in accordance with an approved scheme in accordance with PPG17 and Policies CP14 and DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 61 No trees, hedges or shrubs on the site, other than those the Local Planning Authority has agreed to be felled as part of this permission, shall be wilfully damaged or uprooted, felled/removed, topped or lopped without the previous written consent of the Local Planning Authority until 5 years after completion of the development hereby permitted. Any trees, hedges or shrubs on the site, whether within the tree protective areas or not, which die or become damaged during the construction process shall be replaced with trees, hedging plants or shrubs of a type, size and in positions agreed by the Local Planning Authority.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period, in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 62 No development in relation to Phase 1 will begin, other than remediation, soil testing, site clearance and earthworks approved as part of this application, or such other date or stage in development as may be agreed in writing with the Local Planning Authority, until a detailed drainage strategy based on sustainable drainage principles and an assessment of the hydrological and hydro-geological context of the development, has been submitted to and approved in writing in the Local Planning Authority.

The scheme shall include:

- Full detailed design drawings and associated calculations
- Confirmation that the scheme is in accordance with the approved FRA dated July 2010 (SLR Ref: 403-00404-00027).
- Demonstration that the scheme complies with Advice Note 6 ' Potential Bird Hazards from Sustainable Urban Drainage Schemes (SUDS).
- Demonstration that flows through railway culverts will be restricted to pre-development rates or less.

The development shall be carried out in accordance with the details and any timings of the approved scheme. Any subsequent amendments shall be agreed in writing with the Local Planning Authority.

Reason: To prevent an increased risk of flooding, improve and protect water quality, habitat and amenity and ensure the future maintenance of the drainage system in accordance with Planning Policy Statement 25 - "Development and Flood Risk" (PPS25), PPS23 - "Planning and Pollution Control" and PPS9 - "Biodiversity and Geological Conservation".

This planning condition is necessary to ensure the development complies with the principles of PPS25, PPS23 and PPS9.

- 63 No development in relation to phase 1 shall begin, or such other date or stage in development as may be agreed in writing with the Local Planning Authority, other than remediation soil testing site clearance and earthworks approved as part of this application,

until a drainage strategy detailing any on and/or off site foul drainage works, has been submitted to and approved by, the local planning authority in consultation with the sewerage undertaker. No discharge of foul water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed in accordance with the approved details.

Reason: The development may lead to sewage flooding; to ensure that sufficient capacity is made available to cope with the new development; and in order to avoid adverse environmental impact upon the community in accordance with PPS25 and Policies CP13 and DC7 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

64 The development in Phase 1 as approved by this planning permission, shall be undertaken in compliance with the findings of the Preliminary Risk Assessment, Site Investigations and Remediation Strategy outlined in the following approved SLR reports:

- Kilnwood Vale, Land Quality Assessment, SLR Ref 404-0404-00027, dated June 2010, Version: Final
- Kilnwood Vale Remediation Strategy SLR Ref 404-0404-00027, dated June 2010, Version: Final

Any amendments or updates that are required to the approved preliminary Risk Assessment, Site Investigations and Remediation Strategy shall be submitted to and approved in writing to the LPA.

A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be submitted to, and approved, in writing, by the LPA prior to the occupation of phase 1. This shall include measures to deal with any contamination not previously identified but subsequently found to be present at the site.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed.

This planning condition is necessary to ensure the development complies with the principles of PPS23.

65 Prior to occupation of any dwelling approved by this consent within or partly within the area marked in yellow on Drawing Numbers 16702/SK004 and 16702/SK006 a bund shall be constructed in accordance with the approved verified design as shown in drawing 16702-441-015.

Reason: To ensure that ambient noise levels are acceptable for those dwellings that without the bund in place would be likely to be subjected to unacceptable noise levels.

66 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (Amendment) (No2) (England) Order 2008 (or any order amending or revoking and re-enacting that Order with or without modification), no garages shall be erected [other than those expressly authorised by this permission].

Reason: In the interest of visual amenity and in accordance with Policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 67 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (Amendment) (No2) (England) Order 2008 (or any order revoking and re-enacting that Order with or without modification), no windows/dormer windows [other than those expressly authorised by this permission] shall be constructed.

Reason: To protect the privacy of adjoining properties in accordance with Policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007). To protect the character and appearance of the building in accordance with Policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 68 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 1995 or Orders amending or revoking and re-enacting the same, the building(s) shall not be extended or altered in any way unless planning permission has been granted by the Local Planning Authority on application in that respect.

Reason: A more intensive use of the site would be likely to cause congestion on adjacent roads through overflow vehicle parking contrary to policy DC40 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 69 The building(s) hereby approved shall not be occupied until the parking turning and access facilities have been provided in accordance with the plans hereby approved (or in accordance with plans submitted to and approved in writing by the Local Planning Authority) and the parking turning and access facilities shall thereafter be retained solely for that purpose [and solely in connection with the development].

Reason: To ensure adequate parking, turning and access facilities are available to serve the development in accordance with policy DC40 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- 70 No dwelling hereby permitted shall be occupied unless and until the access road to that dwelling has been completed to base course level with the road construction to be completed within 12 months of first occupation or to a later date to be agreed with the Local Planning Authority.

Reason: To ensure that the construction of the roads are of an adequate standard and meet the design code for the development in accordance with Policies CP13 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 71 A temporary footpath/cyclepath route from Phase 1 providing connectivity to Chetwood Drive, Bewbush shall be designed, laid out and constructed in accordance with details which shall be submitted to and approved in writing by the LPA and provided prior to the occupation of the 20th dwelling.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policies

CP13, DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 72 A footpath/cyclepath route from Phase 1 providing connectivity to Chetwood Drive shall be designed, laid out and constructed to base course level and provided with street lighting by prior to the occupation of the 50th dwelling and completed to wearing course level prior to the occupation of the 100th dwelling. The scheme for the footpath/cycle path shall have previously been submitted to and approved in writing the Local Planning Authority and shall be implemented in accordance with the approved details. The scheme shall include: Full details of lighting, the layout, hard surfacing, existing and proposed levels and the protection of existing landscape features.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policies CP13, DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 73 Prior to the construction of the footbridge located immediately south of plots 280-285 as shown on plan SL-01 Revision U full details of the bridge shall have been submitted to and approved in writing by the Local Planning Authority. The bridge shall be constructed prior to the occupation of plots 286-291, 280-285 and 274-279 in accordance with the approved details, unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policies CP13, DC9 and DC40 of the Horsham District Local Development Framework, Core Strategy and General Development Control Policies 2007.

- 74 Within 6 months of the commencement of phase 1 or prior to the commencement of the SUDS detention pond in Phase 1, whichever is the earliest (other than remediation, soil testing, site clearance and earthworks and any related operations approved as part of this application), full details of the design and appearance of the inlet and outlet structures and retaining walls associated with the SUDS detention pond in Phase 1 shall be submitted to the Local Planning Authority. The development shall be completed in accordance with the details which shall have previously been approved in writing by the Local Planning Authority.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

Part D: Full permission for the construction of a 3 to 6 metre high (above ground level) noise attenuation landform for approximately 700 metres, associated landscaping, pedestrian/cycleway and service provision (land known as Kilnwood Vale)

- 75 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

- 76 The bund as approved by this application shall be constructed in accordance with the approved verified design as shown in Drawings 16702-441-015 and 16702-441-016A.

Reason: To ensure the performance of the bund is as tested by the Environmental Impact Assessment and to ensure that it reduces noise within the future development to acceptable levels in accordance with PPG24.

77

Prior to the commencement of part d) of the development a construction environmental management plan (CEMP) for the works associated with part d) shall be submitted to the LPA for its written approval and thereafter implemented and maintained throughout the construction period in accordance with the approved CEMP. The CEMP shall include:

- Details of the working hours agreed with the LPA for the implementation of the development;
- Details of the design and location of the construction access;
- Details of proposed wheel washing facilities located adjacent the construction site access;
- Details of an area for the storage of materials, parking for construction traffic and an appropriate turning area has been provided within the site clear of the public highway;
- A site waste management plan
- Details of any temporary utilities required
- How the construction will comply with the sustainable use of soils on construction sites.
- Details of a communication strategy to include the provision of a dedicated phone line for residents to contact the site manager directly with complaints which should be manned at all times while site works are in progress.
- Details of a routing agreement for the site construction traffic and HGV traffic associated with the movement of bulk material to and from the site;
- Details of means of suppressing dust during the construction process to include the regime for dust deposition measurement at the site boundaries;
- Details of the measures to mitigate the noise and vibration from construction including those measures identified in sections 13.5.1 to 13.5.4 of the Environmental Statement;
- Details of a surface water drainage scheme for the temporary drainage of the Site. The scheme shall subsequently be implemented in accordance with the approved details. The scheme shall include:
 - demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
 - measures to mitigate any increased risk of sediment entering the watercourses and groundwater.
 - demonstration that there will be no discharge to ground that has been affected by contamination
- Measures for tree and hedgerow protection throughout the development programme;
- A detailed method statement for the removal or long-term management/eradication of Japanese Knotweed on the site. The method statement shall include proposed measures to prevent the spread of Japanese Knotweed during any operations such as mowing, strimming or soil movement. It shall also contain measures to ensure that any soils brought to the site are free of the seeds/root/stem of any invasive plant covered under the Wildlife and Countryside Act 1981.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with

Policies DC5, DC7, DC9 and DC40 of the Horsham District Local Development Framework, General Development Control Policies 2007.

- 78 No development shall commence on part d) of the development until all existing trees/bushes/hedges to be retained within (and immediately adjacent to) any areas of works, have been protected by a fence erected in accordance with the guidance contained in BS 5837:2005 and maintained during the course of development for part d). Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the local planning authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period, in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- A. The development hereby permitted shall be carried out in accordance with the approved plans listed in the schedule below.

Reason: For the avoidance of doubt and in the interest of proper planning.

Schedule of plans/documents:

- 301 Site Location Plan revision A received 25 October 2010
- 137 Site Plan revision L received 25 October 2010
- 248 Hybrid Application Component Plan revision F received 25 October 2010
- 305 Car Parking Plan revision C received 28 June 2011
- SL-01 Overall Site Layout Phase 1 revision U received 6 June 2011
- MAT-01 External Materials and Finishes Phase1 revision D received 28 June 2011
- SE.01 Illustrative Street Elevations (Forms and Materials) revision D received 30 August 2011
- SE.02 Illustrative Street Elevation (Forms and Materials) revision D received 30 August 2011

- A1-01 House type A1 - Floor Plans revision F received 18 April 2011
- A1-02 House type A1 – Elevations revision F received 18 April 2011
- A2-01 House type A2 - Floor Plans revision D received 30 July 2010
- A2-02 House type A2 – Elevations revision F received 30 July 2010
- A3-01 House type A3 - Floor Plans revision F received 18 April 2011
- A3-02 House type A3 – Elevations revision E received 30 July 2010
- A3-03 House type A3 – Elevations revision C received 18 April 2011
- A3-04 House type A3 – Elevations revision B received 30 July 2010
- A3(1)-01 House type A3(1) Floor Plans revision A received 30 July 2010
- A3(1)-02 House type A3(1) Elevations revision B received 30 July 2010
- A3(1)-03 House type A3(3) Elevations revision B received 30 July 2010
- A4-01 House type A4 - Floor Plans revision E received 30 July 2010
- A4-02 House type A4 – Elevations revision E received 30 July 2010
- A4-03 House type A4 – Elevations revision B received 30 July 2010
- A4-04 House type A4 – Elevations revision B received 30 July 2010
- A4(1)-01 House type A4(1) - Floor Plans revision A received 30 July 2010
- A4(1)-02 House type A4(2) –Elevations revision A received 30 July 2010

A4(1)-03 House type A4(3) – Elevations revision A received 30 July 2010
AF1-01 Flat type AF1 - Ground Floor Plan revision F received 30 July 2010
AF1-02 Flat type AF1 - First Floor Plan revision G received 30 July 2010
AF1-03 Flat type AF1 - Second Floor Plan revision G received 30 July 2010
AF1-04 Flat type AF1 - Front Elevation revision F received 30 July 2010
AF1-05 Flat type AF1 - Side Elevation revision E received 18 April 2011
AF1-06 Flat type AF1 - Rear Elevation revision G received 18 April 2011
AF1-07 Flat type AF1 - Side Elevation revision F received 30 July 2010
AF3-01 Flat type AF3 - Ground Floor Plan revision F received 30 July 2010
AF3-02 Flat type AF3 - First Floor Plan revision F received 30 July 2010
AF3-03 Flat type AF3 - Second Floor Plan revision F received 30 July 2010
AF3-04 Flat type AF3 - Front, Side Elevation revision E received 30 July 2010
AF3-05 Flat type AF3 - Rear, Side Elevation revision C received 30 July 2010
HC-01 House Type C Floor Plans revision F received 30 July 2010
HC-02 House Type C Elevations revision G received 30 July 2010
HC1-01 House Type C1 Floor Plans revision B received 18 April 2011
HC1-02 House Type C1 Elevations revision D received 18 April 2011
HC2-01 House Type C2 - Plot 21 Floor Plans revision C received 8 February 2011
HC2-02 House Type C2 - Plot 21 Elevations revision D received 8 February 2011
HC3-01 House Type C3 Floor Plans revision G received 30 July 2010
HC3-02 House Type C3 Elevations revision E received 30 July 2010
HD-01 House Type D Floor Plans revision G received 30 July 2010
HD-02 House Type D Elevations revision G received 30 July 2010
E-01 House Type E Floor Plans revision E received 30 July 2010
E-02 House Type E Elevations revision F received 30 July 2010
HG-01 House Types G & G1 Floor Plans revision F received 30 July 2010
HG-02 House Types G & G1 Elevations revision G received 30 July 2010
HG2-03 House Type G2 Floor Plans revision B received 30 July 2010
HG2-04 House Type G2 Elevations revision C received 30 July 2010
HH-01 House Type H Floor Plans revision H received 8 February 2011
HH-02 House Type H Floor Plans revision C received 30 July 2010
HH-03 House Type H Elevations revision J received 8 February 2011
HH1-01 House Type H1 Floor Plans revision H received 8 February 2011
HH1-02 House Type H1 Elevations revision H received 30 July 2010
HH2-01 House Type H2 Floor Plans revision C received 30 July 2010
HH2-02 House Type H2 Elevations revision C received 30 July 2010
HJ-01 House Type J Floor Plans revision F received 30 July 2010
HJ-02 House Type J Elevations revision F received 30 July 2010

HLL1-01 House Types L & L1 Floor Plans revision E received 30 July 2010
HLL1-02 House Types L & L1 Elevations revision D received 30 July 2010
HM-01 House Type M Floor Plans revision H received 30 July 2010
HM-02 House Type M Elevations revision G received 30 July 2010
HN-01 House Type N Floor Plans revision H received 8 February 2011
HN-02 House Type N Elevations revision H received 8 February 2011
HN-03 House Type N Elevations revision G received 30 July 2010
HP-01 House Type P Floor Plans revision E received 8 February 2011
HP-02 House Type P Elevations revision G received 8 February 2011
HP1-01 House Type P1 Floor Plans revision E received 11 August 2011
HP1-02 House Type P1 Elevations revision E received 8 February 2011
HR-01 House Type R Floor Plans revision H received 30 July 2010
HR-02 House Type R Elevations revision F received 30 July 2010

HS-01 House Type S Floor Plans revision J received 18 April 2011
HS-02 House Type S Elevations revision G received 8 February 2011
HS1-01 House Type S1 Floor Plans revision E received 8 February 2011
HS1-02 House Type S1 Elevations revision G received 8 February 2011
F1-01 Flat Type F1 Ground Floor Plan revision D received 30 July 2010
F1-02 Flat Type F1 First Floor Plan revision D received 30 July 2010
F1-03 Flat Type F1 Second Floor Plan revision D received 30 July 2010
F1-04 Flat Type F1 Elevation 1 revision F received 30 July 2010
F1-05 Flat Type F1 Elevation 2 revision F received 30 July 2010
F1-06 Flat Type F1 Rear & Side Elevations revision F received 30 July 2010
F2-01 Flat Type F1 Ground Floor Plan revision E received 30 July 2010
F2-02 Flat Type F2 First Floor Plan revision D received 30 July 2010
F2-03 Flat Type F2 Second Floor Plan revision D received 30 July 2010
F2-04 Flat Type F2 Front Elevation revision E received 30 July 2011
F2-05 Flat Type F2 Rear & Side Elevations revision E received 30 July 2011
F3-01 Flat Type F3 Ground Floor Plan revision F received 8 February 2011
F3-02 Flat Type F3 First Floor Plan revision F received 8 February 2011
F3-03 Flat Type F3 Second Floor Plan revision F received 8 February 2011
F3-04 Flat Type F3 Elevations revision F received 8 February 2011
F3-05 Flat Type F3 Elevations revision F received 8 February 2011
GC-01 Single Garage/Cycle Store1 Floor Plans/Elevations received 30 July 2010
GC-02 Double Garage/Cycle Store2 Floor Plans/Elevations received 30 July 2010
GC-03 Double Garage/Cycle Store 3 Floor Plans / Elevations received 30 July 2010
G-02 Double Garage Floor Plans / Elevations received 30 July 2010
G-03 Triple Garage / Cycle Store Floor Plans / Elevations received 30 July 2010
G-04 Garages/Cycle Store Type A Floor Plans / Elevations received 30 July 2010
G-05 Garages/Cycle Store Type B Floor Plans / Elevations received 30 July 2010
G-06 Bin/Cycle Store Floor Plans / Elevations received 30 July 2010
G-07 Drive through/Garage Floor Plans / Elevations received 30 July 2010
G-08 Car Port Floor Plans / Elevations received 30 July 2010
G-09 Quadruple Garage Floor Plans / Elevations received 30 July 2010
G-10 Bin/Cycle Store Floor Plans / Elevations received 30 July 2010
G-11 Car Ports received 18 April 2011

ECP 1 Existing Contour Plan revision 0 received 30 July 2010
PCP 1 Proposed Contour Plan revision 0 received 30 July 2010
EPP 1 Existing and Proposed Profile revision 0 received 30 July 2010
EP1 Earthworks Movement Plan - Phase 1 revision 0 received 30 July 2010
EP2 Earthworks Movement Plan - Phase 2 revision 0 received 30 July 2010
EP3 Earthworks Movement Plan - Phase 3 revision 0 received 30 July 2010

16702/010/111 M23 J11: Proposed Final Highway Layout revision D received 7 March 2011

16702/010/112 M23 J11: Proposed Interim Highway Layout revision C received 7 March 2011

16702/SK003 Kilnwood Vale, development area within Phase 2 2022 with development – daytime noise 2nd floor (worst case) contour with no bund ≥ 63 dB LAeq, 16hrs received 28 July 2011

16702/SK004 Kilnwood Vale, development area within Phase 1 2022 with development – daytime noise 2nd floor (worst case) contour with no bund ≥ 63 dB LAeq, 16hrs received 28 July 2011

16702/SK005 Kilnwood Vale, development area within Phase 2 2022 with development – night time noise 2nd floor (worst case) contour with no bund ≥ 57 dB LAeq. 8hrs received 3 August 2011

16702/SK006 Kilnwood Vale, development area within Phase 1 2022 with development – night time noise 2ⁿ floor (worst case) contour with no bund ≥ 57 dB LAeq. 8hrs received 3 August 2011

16702-441-015 Kilnwood Vale Crawley noise bund parameters position and height of bund crest, sheet 1 of 2, received 23 June 2011

16702-441-016 Kilnwood Vale Crawley noise bund parameters position and height of bund crest, sheet 2 of 2, revision A received 23 June 2011

16702/441/007 Road & Street Lighting, Lighting Classes revision A received 30 July 2011

16702/441/R04/01 General Arrangement revision A received 30 July 2010

16702/441/R04/02 Alignment revision A received 23 June 2011

16702/441/R04/03 Geometry and Visibility revision B received 7 February 2011

16702/441/R04/04 Roundabout Layout – Deflection revision A received 30 July 2010

16702/441/R04/05 Vehicle Swept Path Analysis revision A received 30 July 2010

16702/441/R04/06 Vehicle Swept Path Analysis revision A received 30 July 2010

16702/441/R04/07 Traffic Signals revision A received 30 July 2010

16702/441/R04/08 Road Lighting revision A received 30 July 2010

16702/441/R04/09 Traffic Signs, Landscaping and Street Furniture revision A received 30 July 2010

16702/441/R04/10 Road Restraint Risk Assessment revision C received 7 February 2011

16702/441/R04/11 Noise Mitigation revision A received 30 July 2010

16702/441/R04/12 DMRB Standards – Relaxations and Departures revision A received 30 July 2010

16702/441/R04/13 Future Relief Road Gyratory revision A received 30 July 2010

16702/441/PA/01 Phase 1: A264 Accesses revision A received 11 August 2011

16702/441/PA/02 Whole Site: Illustrative Bus Gate Plan revision A received 30 July 2010

16702/441/PA/03 Phase 1: Visibility revision C received 4 August 2011

16702/441/PA/04 Phase 1: Vehicle Swept Path Analysis: Panttechnicon revision C received 4 August 2011

16702/441/PA/05 Phase 1: Vehicle Swept Path Analysis: Refuse Vehicle and Bin Collection Points revision E received 31 August 2011

16702/441/PA/06-01 Phase 1: Vehicle Swept Path Analysis: Bus and Cars sheet 1 revision B received 4 August 2011

16702/441/PA/06-02 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 2 revision B received 4 August 2011

16702/441/PA/06-03 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 3 revision B received 4 August 2011

16702/441/PA/06-04 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 4 revision B received 4 August 2011

16702/441/PA/06-05 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 5 revision B received 4 August 2011

16702/441/PA/06-06 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 6 revision B received 4 August 2011

16702/441/PA/06-07 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 7 revision B received 4 August 2011

16702/441/PA/07 Phase 1: Highways Horizontal Alignment revision B received 4 August 2011

16702/441/PA/08 Phase 1: Highway Vertical Alignment revision B received 4 August 2011

16702/441/PA/09 Phase 1: Street & Parking Court Lighting revision C received 4 August 2011

16702/441/PA/10 Site Access: Street Lighting revision B received 4 August 2011
16702/441/PA/11 Phase 1: Finished Floor Levels revision B received 4 August 2011
16702/441/PA/12 Phase 1: Foul & Surface Water Drainage revision D received 4 August 2011
16702/441/PA/13 Whole Site: Sub Station Details revision A received 30 July 2010
16702/441/PA/14-01 Utility Infrastructure Plan & Existing Services revision B received 7 February 2011
16702/441/PA/14-02 Utility Infrastructure Plan & Existing Services revision A received 30 July 2010
16702/441/PA/15 Phase 1: Bewbush Footpath/ Cycle Path & Bridleway Link revision D received 7 February 2011

16702/441/R05 Whole site and Phase 1 Utility Report revision A received 30 July 2010
16702/441/R06 Phase 1 Street Lighting Report revision A received 30 July 2010
16702/441/R04 Design Statement A264 Site Access revision A received 30 July 2010
16702/441/R004 Addendum - Design Statement A264 Site Access Section 3 & Appendix D - output from RRRAP, revision C received 7 February 2011

0404.00027.16.DT.001 Proposed Sections - Gateway / A264 Bund (Sheet 1 of 2) revision 4 received 3 August 2011
0404.00027.16.DT.002 Proposed Sections - Gateway / A264 Bund (Sheet 2 of 2) revision 2 received 3 August 2011
0404.00027.16.DT.003 Proposed Sections - A264 Bund East (Sheet 1 of 2) revision 2 received 3 August 2011
0404.00027.16.DT.004 Proposed Sections - A264 Bund East (Sheet 2 of 2) revision 2 received 3 August 2011
0404.00027.16.DT.005 Proposed Sections - Phase 1 SuDS Pond (Sheet 1 of 3) revision 1 received 30 July 2010
0404.00027.16.DT.006 Proposed Sections - Phase 1 SuDS Pond (Sheet 2 of 3) revision 1 received 30 July 2010
0404.00027.16.DT.007 Proposed Sections - Phase 1 SuDS Pond (Sheet 3 of 3) revision 1 received 30 July 2010
0404.00027.16.DT.008 Proposed Sections - Gateway Village Green / Duck Pond revision 1 received 30 July 2010
0404.00027.16.DT.009 Proposed Sections - Western Boundary (Phase 1) received 7 February 2011
0404.00027.16.DT.050 Boundary Details - Rear Gardens (Sheet 1 of 2) revision 1 received 30 July 2010
0404.00027.16.DT.051 Boundary Details - Rear Gardens (Sheet 2 of 2) revision 1 received 30 July 2010
0404.00027.16.DT.052 Boundary Details - Garden Gates and Driveway Gates revision 2 received 7 February 2011
0404.00027.16.DT.053 Boundary Details - Feature Walls revision 2 received 7 February 2011
0404.00027.16.DT.054 Boundary Details - 1.4m High timber post and rail fencing (to semi-private areas) revision 2 received 7 February 2011
0404.00027.16.DT.055 Boundary Details - 1.2m High timber post and wire with top and bottom rail (to NW Phase 1 - temporary) revision 1 received 7 February 2011
0404.00027.16.DT.056 Boundary Details - 1.4m High timber post and wire with top with wire mesh panels (to western boundary) received 7 February 2011

0404.00027.16.SS.001 Existing Site Survey Overview revision 1 received 30 July 2010
0404.00027.16.SS.002 Existing Site Survey (Sheet 1 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.003 Existing Site Survey (Sheet 2 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.004 Existing Site Survey (Sheet 3 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.005 Existing Site Survey (Sheet 4 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.006 Existing Site Survey (Sheet 5 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.007 Existing Site Survey (Sheet 6 of 8) revision 1 received 30 July 2010
0404.00027.16.SS.008 Existing Site Survey (Sheet 7 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.009 Existing Site Survey (Sheet 8 of 8) revision 1 received 30 July 2010

0404.00027.16.TSP.001 Tree Survey Plan - Inset A revision 1 received 11 August 2011
0404.00027.16.TSP.002 Tree Survey Plan - Inset B revision 1 received 30 July 2011
0404.00027.16.TSP.003 Tree Survey Plan - Inset C & D revision 1 received 30 July 2011
0404.00027.16.TSP.004 Tree Survey Plan - Inset E revision 1 received 30 July 2011
0404.00027.16.TSP.005 Tree Survey Plan - Inset F revision 1 received 30 July 2011
0404.00027.16.TSP.006 Tree Survey Plan - Inset G revision 1 received 30 July 2011
0404.00027.16.TSP.007 Tree Survey Plan - Inset H revision 1 received 30 July 2011
0404.00027.16.TSP.050 Tree Constraints Plan - BS5837 Tree Survey received 11 August 2011

0404.00027.16.SO.001 Tree Felling / Retention / Protection Overview revision 2
received 7 February 2011
0404.00027.16.SO.002 Tree Felling / Retention / Protection (Sheet 1 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.003 Tree Felling / Retention / Protection (Sheet 2 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.004 Tree Felling / Retention / Protection (Sheet 3 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.005 Tree Felling / Retention / Protection (Sheet 4 of 14) revision 1
received 30 July 2011
0404.00027.16.SO.006 Tree Felling / Retention / Protection (Sheet 5 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.007 Tree Felling / Retention / Protection (Sheet 6 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.008 Tree Felling / Retention / Protection (Sheet 7 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.009 Tree Felling / Retention / Protection (Sheet 8 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.010 Tree Felling / Retention / Protection (Sheet 9 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.011 Tree Felling / Retention / Protection (Sheet 10 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.012 Tree Felling / Retention / Protection (Sheet 11 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.013 Tree Felling / Retention / Protection (Sheet 12 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.014 Tree Felling / Retention / Protection (Sheet 13 of 14) revision 2
received 7 February 2011
0404.00027.16.SO.015 Tree Felling / Retention / Protection (Sheet 14 of 14) received 30 July 2010

0404.00027.16.GA.050 General Arrangement Overview revision 4 received 7 February 2011
0404.00027.16.GA.051 General Arrangement (Sheet 1 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.052 General Arrangement (Sheet 2 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.053 General Arrangement (Sheet 3 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.054 General Arrangement (Sheet 4 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.055 General Arrangement (Sheet 5 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.056 General Arrangement (Sheet 6 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.057 General Arrangement (Sheet 7 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.058 General Arrangement (Sheet 8 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.059 General Arrangement (Sheet 9 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.060 General Arrangement (Sheet 10 of 14) revision 4 received 7 February 2011

0404.00027.16.GA.061 General Arrangement (Sheet 11 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.062 General Arrangement (Sheet 12 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.063 General Arrangement (Sheet 13 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.100 Phase 1 Masterplan revision 1 received 7 February 2011

0404.00027.16.GA.210 Open Space Strategy and Phasing Plan revision D received 4 August 2011

0404.00027.16.PP.001 Proposed Planting Plan Overview revision 2 received 7 February 2011
0404.00027.16.PP.002 Proposed Planting Plan (Sheet 1 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.003 Proposed Planting Plan (Sheet 2 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.004 Proposed Planting Plan (Sheet 3 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.005 Proposed Planting Plan (Sheet 4 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.006 Proposed Planting Plan (Sheet 5 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.007 Proposed Planting Plan (Sheet 6 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.008 Proposed Planting Plan (Sheet 7 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.009 Proposed Planting Plan (Sheet 8 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.010 Proposed Planting Plan (Sheet 9 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.011 Proposed Planting Plan (Sheet 10 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.012 Proposed Planting Plan (Sheet 11 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.013 Proposed Planting Plan (Sheet 12 of 12) revision 2 received 7 February 2011

403.0404.00027 Site Waste Management Plan received 30 July 2010

Housing Mix Schedule revision B received 30 July 2010

Kilnwood Vale Design and Access Statement received 30 July 2010

Kilnwood Vale Supplementary note to Design and Access Statement - February 2011
received 7 February 2011

Kilnwood Vale Strategic Design Code received 30 July 2010

Kilnwood Vale Planning Statement received 30 July 2010

Kilnwood Vale Environmental Impact Assessment – Volumes 1, 2 and 3 including landscape and visual
impact assessment photomontages received 30 July 2010

Kilnwood Vale Sustainability Statement received 30 July 2010

Kilnwood Vale Open Space Strategy received 30 July 2010

Arboricultural Survey received 30 July 2010

Gatwick Safeguarding Plan LGW1924 received 3 October 2011

Note to Applicant

Under section 109 of the Water Resources Act 1991 and/or byelaws, any works or structures whatsoever, in, over, under or within 8 metres of a main river (including the erection of any flow control structures) require the prior written consent of the Environment Agency.

Note to Applicant

Under Section 23 of the Land Drainage Act 1991, if it is proposed to fill, divert, obstruct or culvert a watercourse (including the erection of any flow control structures or realignment), the applicant would require a Flood Defence Consent from the Environment Agency.

Note to Applicant

Under the Water Resources Act 1991, any impoundment of a watercourse to create ponds will require an impoundment licence from the Environment Agency. Any impoundment licence will be subject to a condition that ensures 'compensation flow' at all times.

Note to Applicant

We will require full design details and calculations for the proposed control structure (demonstrating no increase in either the volume or rate of surface water leaving the site and including any necessary provisions for a low flow bypass and/or fish bypass) to be submitted. The drawings for the design of the control structure for the attenuation feature (on-line pond), to clearly show how it will retain the 'pond' bed as close to a natural watercourse as possible will also be required.

Note to Applicant

We would encourage the applicant to contact Nick Foulkes (nick.foulkes@environment-agency.gov.uk) and Ruth Hanniffy (Ruth.Hanniffy@environment-agency.gov.uk) as soon as possible for advice relating to the impact that the proposed structure will have on fish passage and ecology.

Note to Applicant

We recommend, prior to occupation of the development, due consideration of the maintenance and management of the Sustainable Drainage Schemes (SuDS).

Note to Applicant

HDC will expect a high quality building design for the CHP plant. Whilst it is appreciated that the technology selected will set certain engineering design constraints particular attention should be given to its scale, mass, height and appearance so as not to create an overbearing relationship and adversely affect the visual amenity of residents in the phase 1 development area or the wider landscape impact. In addition, whilst the building heights parameter plan would allow a chimney up to 60M height HDC would encourage use of a technology and design that can minimise the height needed.

Note to Applicant

Prior to the commencement of any works on site, developers must contact Network Rail to inform them of their intention to commence works. This must be undertaken a minimum of 6 weeks prior to the proposed date of commencement.

Note to Applicant

Children's play areas, open spaces and amenity areas must be protected by a secure fence along the boundary of one of the following kinds, concrete post and panel, iron railings, steel palisade or such other fence approved by the Local Planning Authority acting in consultation with the railway undertaker to a minimum height of 2 metres and the fence shall not be able to be climbed.

Note to Applicant

Hedge planted adjacent to Network Rail's boundary fencing for screening purposes should be so placed that when fully grown it does not damage the fencing or provide a means of scaling it. No hedge should prevent Network Rail from maintaining its boundary fencing.

Lists of trees that are permitted and those that are not permitted are provided below and these should be added to any tree planting conditions:

Permitted:

Birch (Betula), Crab Apple (Malus Sylvestris), Field Maple (Acer Campestre), Bird Cherry (Prunus Padius), Wild Pear (Pyrus Communis), Fir Trees - Pines (Pinus), Hawthorne (Cretaegus), Mountain Ash - Whitebeams (Sorbus), False Acacia (Robinia), Willow Shrubs (Shrubby Salix), Thuja Plicatata "Zebrina"

Not Permitted:

Alder (*Alnus Glutinosa*), Aspen - Poplar (*Populus*), Beech (*Fagus Sylvania*), Wild Cherry (*Prunus Avium*), Hornbeam (*Carpinus Betulus*), Small-leaved Lime (*Tilia Cordata*), Oak (*Quercus*), Willows (*Salix Willow*), Sycamore - Norway Maple (*Acer*), Horse Chestnut (*Aesculus Hippocastanum*), Sweet Chestnut (*Castanea Sativa*), London Plane (*Platanus Hispanica*).

Note to Applicant

With regard to surface water drainage it is the responsibility of a developer to make proper provision for drainage to ground, water courses or a suitable sewer. In respect of surface water it is recommended that the applicant should ensure that storm flows are attenuated or regulated into the receiving public network through on or off site storage. When it is proposed to connect to a combined public sewer, the site drainage should be separate and combined at the final manhole nearest the boundary. Connections are not permitted for the removal of Ground Water. Where the developer proposes to discharge to a public sewer, prior approval from Thames Water Developer Services will be required. They can be contacted on 0845 850 2777.

Note to Applicant

A Trade Effluent Consent will be required for any Effluent discharge other than a 'Domestic Discharge'. Any discharge without this consent is illegal and may result in prosecution. (Domestic usage for example includes - toilets, showers, washbasins, baths and canteens). Typical Trade Effluent processes include: - Laundrette/Laundry, PCB manufacture, photographic/printing, food preparation, abattoir, farm wastes, vehicle washing, metal plating/finishing, cattle market wash down, chemical manufacture, treated cooling water and any other process which produces contaminated water. Pre-treatment, separate metering, sampling access etc, may be required before the Company can give its consent. Applications should be made to Waste Water Quality, Crossness STW, Belvedere Road, Abbeywood, London. SE2 9AQ. Telephone: 020 8507 4321.

Note to Applicant

Thames Water would recommend that petrol/oil interceptors be fitted in all car parking/washing/repair facilities. Failure to enforce the effective use of petrol / oil interceptors could result in oil-polluted discharges entering local watercourses.

Note to Applicant

The applicant should note that a detailed planning application will be required for any bridges constructed in connection with this application (excluding the bridge over the SUDS in Phase 1) with particular reference to conditions 31 and 73 above.

Note to Applicant

In addition to the details already submitted pursuant to condition x (this condition - The detailed landscape scheme for the A264 landscape buffer, A264 highway access and for the Phase 1 residential development shall be approved in writing by the local planning authority and implemented in accordance with an agreed timetable which shall be submitted and agreed in writing by the Local Planning Authority within 4 months of the commencement of development.) the additional details which are required are:

- Tree pit and staking/underground guying details
- A written hard and soft landscape specification (National Building Specification compliant)
- Details of amenity grass and wildflower seeding mixes
- Details of any swales or any other hard and soft landscape feature associated with SUDS

Note to Applicant

Notwithstanding the formal design principles and illustrative layout for the Viewpoint Open Space included within the Design and Access Statement and the Open Space Strategy HDC will expect a

more informal design and layout for this area which would ensure a landscape character more appropriate to its edge of countryside location.

Note to Applicant

The provision of green roofs, green walls and rainwater gardens associated with community, retail, school and employment buildings and residential blocks of flats is strongly recommended to enhance Suds source control provision, to maximise landscape and biodiversity enhancements and generally improve the sustainable construction credentials of the development.

Note to Applicant

HDC will expect sensitive design and integration of Suds features both in open spaces and any located within the streetscape and other areas of the public realm of the development. They should be designed to ensure they enhance the landscape and biodiversity, rather than as purely engineered features. Particular attention will be given to details such as their profiles, planting, and the appearance of inlet and outlet features.

Consideration should be given, as part of the reserved matters submissions for each future phase of the development, to:

- a) combining hedges with post and rail or picket fences to provide garden boundaries (rather than 2m height close boarded fences)
- b) provision of medium – large potential size trees within larger gardens to strengthen the green infrastructure of the site and to provide a landscape and biodiversity enhancement
- c) Appropriate landscape treatment of any parking court areas using a combination of softening tree, shrub and climbing planting to soften walls, fences and hard surface areas, ensuring adequate space for future growth and ensuring provision is made for their long term maintenance
- d) Provision of semi-mature size nursery stock trees at key locations within the development such as squares, open spaces or gateways to ensure more initial landscape impact in these prominent locations
- e) Inclusion of drought resistant species to mitigate against the impact of climate change

Note to Applicant

Notwithstanding the illustrative design and access statement proposals for a needle public art feature of considerable height in the Circus area it is expected that any public art feature that is included in this area will be of a scale and height that avoids any adverse visual impact on the High Weald AONB and the wider landscape.

Note to Applicant

HDC will expect a high quality building design for the CHP plant. Whilst it is appreciated that the technology selected will set certain engineering design constraints particular attention should be given to its scale, mass, height and appearance so as not to create an overbearing relationship and adversely affect the visual amenity of residents in the phase 1 development area or the wider landscape impact. In addition, whilst the building heights parameter plan would allow a chimney up to 60M height HDC would encourage use of a technology and design that can minimise the height needed.

Note to Applicant

Taking into the consideration the loss of the tree clump G6 as part of the permitted development, a prominent feature in the local landscape which includes mature oak trees it is expected that the viewpoint open space will include provision of at least 5 no semi-mature oak trees of 50-60cm size, by way of appropriate compensation for the loss of G6

Note to Applicant

Notwithstanding the strategic design code HDC reserves the right when considering detailed landscape submissions for each phase to seek variation to the plant species lists and hard landscape palette, taking into consideration precise design and layout considerations, particular environmental constraints and the long build out time of the development.

Note to Applicant

The knoll landform feature will be a prominent local landmark. HDC will expect the reserved matters submission for this area to include a sculptural landform with swathes of wildflowers of single colours and well designed park furniture to be provided.

Note to Applicant

Pre application discussion is encouraged with HDC's Landscape Architect, as well as the relevant HDC leisure officers, prior to the submission of any reserved matters applications for the key open spaces on the development site. This can ensure at an early stage that appropriate consideration is given to their design and layout and the facilities to be provided within them.

Note to Applicant:

In making this decision the Council has had regard to the following policy(ies) from the Local Development Framework Core Strategy/Local Development Framework General Development Control Policies:

JAAP, PPS1, PPS9, PPG13, PPS23, PPG24, PPS25, CP1, CP13, DC2, DC5, DC7, DC9, DC10, DC40

Note to Applicant:

You are advised that this permission does not constitute an approval under the Building Regulations. Before you proceed with your proposal you should ensure that a Building Control application is not required, or has been submitted. The Building Control Department can be contacted on 01403 215151.

REASONS FOR GRANTING PLANNING PERMISSION:

1. The proposal is consistent with the provisions of the development plan.

N.B. PLANNING APPEAL PROCESS

If you are aggrieved by the decision to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under Section 78 of the Town and Country Planning Act 1990.

You must appeal within 12 weeks of the date of the decision notice for a householder application and within 26 weeks for other types of planning applications. Please note, only the applicant possesses the right of appeal.

The details of how to appeal together with the form which must be used can be obtained from the Planning Inspectorate at Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN or on-line at www.planningportal.gov.uk/pcs

Appendix B

Planning decision notice DC/13/1437 (14 February 2014)



Sarah Beuden
Savills
2 Charlotte Place
Southampton
Hampshire
SO14 0TB

Application Number: DC/13/1437

TOWN AND COUNTRY PLANNING ACT, 1990 (as amended)
TOWN AND COUNTRY PLANNING (Development Management Procedure) (England) Order 2010

On behalf of: Crest Strategic Projects Ltd

In pursuance of their powers under the above-mentioned Act and Order, the Council hereby notify you that they PERMIT the following development, that is to say:

Engineering operations associated with landfill remediation and associated infrastructure including pumping station

Kilnwood Vale Crawley Road Faygate West Sussex

to be carried out in accordance with Application No. DC/13/1437 submitted to the Council on 31/07/2013 and subject to compliance with the plans/documents and conditions specified hereunder.

H. F. Coplestone

Hilary Coplestone
Development Manager

Date: 14/02/2014

- 1 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

- 2 Prior to the commencement of the development a construction environmental management plan (CEMP) for the works hereby permitted shall be submitted to the Local Planning Authority for its written approval and thereafter implemented and maintained throughout the construction period in accordance with the approved CEMP. The CEMP shall include:

- Details of the working hours agreed with the LPA for the implementation of the development;
- Details of the design and location of the construction access;
- Details of proposed wheel washing facilities located adjacent the construction site access;
- Details of an area for the storage of materials, parking for construction traffic and an appropriate turning area has been provided within the site clear of the public highway;
- A site waste management plan

- Details of any temporary utilities required
- How the construction will comply with the sustainable use of soils on construction sites.
- Details of a communication strategy to include the provision of a dedicated phone line for residents to contact the site manager directly with complaints which should be manned at all times while site works are in progress.
- Details of a routing agreement for the site construction traffic and HGV traffic associated with the movement of bulk material to and from the site;
- Details of means of suppressing dust during the construction process to include the regime for dust deposition measurement at the site boundaries;
- Details of the measures to mitigate the noise and vibration from construction including those measures identified in sections 13.5.1 to 13.5.4 of the Environmental Statement;
- Details of a surface water drainage scheme for the temporary drainage of the Site. The scheme shall subsequently be implemented in accordance with the approved details. The scheme shall include:
 - demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
 - measures to mitigate any increased risk of sediment entering the watercourses and groundwater.
 - demonstration that there will be no discharge to ground that has been affected by contamination
 - Measures for tree and hedgerow protection throughout the development programme;
 - A detailed method statement for the removal or long-term management/eradication of Japanese Knotweed on the site. The method statement shall include proposed measures to prevent the spread of Japanese Knotweed during any operations such as mowing, strimming or soil movement. It shall also contain measures to ensure that any soils brought to the site are free of the seeds/root/stem of any invasive plant covered under the Wildlife and Countryside Act 1981.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with policies DC5, DC7, DC9 and DC40 of the Horsham District Local Development Framework: General Development Control Policies 2007.

- 3 No development shall commence until all existing trees/bushes/hedges to be retained within (and immediately adjacent to) any areas of works, have been protected by a fence erected in accordance with the guidance contained in BS 5837:2005 and maintained during the course of the development. Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the local planning authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with policy DC9 of the Horsham District Local Development Framework: General Development Control Policies 2007.

- 4 A detailed scheme for temporary hydroseeding of the Knoll shall be submitted to and approved in writing by the local planning authority prior to the commencement of the

earthworks operations that will form the basic landform of the Knoll. The approved scheme shall then be implemented according to an agreed timescale to be submitted to and approved in writing with the Local Planning Authority.

Reason: To ensure no erosion of the Knoll feature occurs before the precise final landform details for the Knoll are agreed as part of a future reserved matters submission and implemented in accordance with policies DC2 and DC9 of the Horsham District Local Development Framework: General Development Control Policies 2007.

- 5 Notwithstanding the submitted details, no development shall begin, or other such date or stage in development as may be agreed in writing with the Local Planning Authority, until full details of the earthworks proposals along the Bewbush Brook corridor have been submitted to and approved, in writing, by the Local Planning Authority. These details shall include existing and proposed levels, grading and contours to be formed, existing and proposed cross sections showing the relationship of the proposed slopes to the surrounding landform, together with details of the proposed Bewbush Brook realignment and profile, and any associated structures. The proposals should demonstrate how an accessible, useable and attractive riparian corridor would be created and include illustrative planting and footpath proposals. The development shall then be carried out in full accordance with the approved details.

Reason: To ensure the delivery of a high quality development as required by policy CP1 of the Horsham District Local Development Framework: Core Strategy and the Land West of Bewbush Joint Area Action Plan.

- 6 No earthworks or recontouring shall begin until a scheme for the temporary drainage of the site has been submitted to and approved, in writing, by the Local Planning Authority. The scheme shall subsequently be implemented in accordance with the approved details/timings embodied within the scheme and any subsequent amendments shall be agreed in writing with the Local Planning Authority.

The scheme shall also include:

- demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
- measures to mitigate any increased risk of sediment entering the watercourses.

Reason: To prevent the increased risk of flooding and to protect water quality, in accordance with the NPPF and policy DC7 of the Horsham District Local Development Framework: General Development Control Policies (2007).

- A. The development hereby permitted shall be carried out in accordance with the approved plans listed in the schedule below.

Reason: For the avoidance of doubt and in the interest of proper planning.

Schedule of plans/documents:

Site plan Drwg no. 19956/50 REV A Received: 17.09.2013
Site plan Drwg no. 19956/52 REV A Received: 18.09.2013
Site plan Drwg no. CONTOUR PLAN 12241/46 REV A Received: 31.07.2013
Site plan Drwg no. MOVEMENT PLAN 47062285/PH2-3/163 Received: 31.07.2013
Site plan Drwg no. PROFILE PLAN 47062285/PH2-3/140 Received: 31.07.2013
Design & Access Statement Drwg no. BARTON WILLMORE (REV E) Received: 31.07.2013
Other Drwg no. URS SURFACE, FOUL WATER & FRA Received: 31.07.2013
Planning Statement Drwg no. SAVILLS JULY 2013 Received: 31.07.2013
Other Drwg no. URS EARTHWORKS & REMEDIATION Received: 31.07.2013

Note to Applicant

Given the nature of the proposed development it is possible that a crane may be required during its construction. We would, therefore, draw the applicant's attention to the requirement within the British Standard Code of Practice for the safe use of Cranes, for crane operators to consult the aerodrome before erecting a crane in close proximity to an aerodrome. Gatwick Airport requires a minimum of four weeks notice. For crane queries/applications please email gal.safeguarding@gatwickairport.com. The crane process is explained further in Advice Note 4 'Cranes and Other Construction Issues' (available at www.aoa.org.uk/operations-safety/).

Note to Applicant

The knoll landform feature will be a prominent local landmark. HDC will expect the reserved matters submission for this area to include a sculptural landform with swathes of wildflowers of single colours and well designed park furniture to be provided.

Note to Applicant

Statement pursuant to Article 31 of the Town and Country Planning (Development Management Procedure) (England) (Amendment No. 2) Order 2012. The Local Planning Authority has acted positively and proactively in determining this application by assessing the proposal against all material considerations, including planning policies and any representations that may have been received and subsequently determining to grant planning permission in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.

Note to Applicant:

In making this decision the Council has had regard to the following policy(ies) from the Local Development Framework Core Strategy/Local Development Framework General Development Control Policies:

CP1 CP2 CP3 CP6 CP13 DC2 DC4 DC5 DC7 DC10 DC22 DC40

ADDITIONAL INFORMATION

Planning Permission – Important Provisos

If planning permission has been granted, please note that your Notice of Decision refers only to consideration of your proposal under the Town and Country Planning Acts. It is not a building regulations approval and does not mean that you can disregard other Acts of Regulations, or avoid any other legal obligations. Some of these obligations, of particular relevance to your proposal are referred to elsewhere in this note. Before you proceed with your proposal you should ensure that a Building Control application is not required, or has been submitted. The Building Control Department can be contacted on 01403 215151.

If this permission relates to new dwellings, commercial premises or other buildings which will require a new postal address you should contact the Council's Street Naming & Numbering Department as soon as possible or before work commences on site. Further details are available on the Street Naming page on the Council's website or alternatively e-mail streetnaming@horsham.gov.uk or telephone 01403 215139.

It must be stressed that the information included on this Notice of Decision may not include all your legal obligations, and it does not grant you rights to carry out works on or over lands, or to access land that is not within your control or ownership.

Compliance with the Approved Plans and Conditions

The development hereby approved must be implemented in accordance with the approved plans and any conditions set out in the Notice. Some of the conditions may specify that works are to be carried out, and/or details submitted and approved before all or part of the development is started. These will appear in the 'Pre Commencement Conditions' section of the Notice.

If works on implementing this permission is started without these requirements being fully met, the development may be unauthorised and the permission invalidated, and could lead to enforcement proceedings or in some cases to prosecution.

Amendments

Should alterations or amendments be required to the approved plans, it will be necessary to apply either under Section 96A of the Town and Country Planning Act 1990 for non material alterations, or under Section 73 of the Act for minor material alterations. An application must be made using the standard application form and you should consult with us, to establish the correct type of application to be made.

Monitoring

Horsham District Council monitors the implementation of planning permissions. Please be aware that monitoring officers may visit the application site at various stages of the development to ensure compliance with the approved plans and conditions.

Conditions Compliance

Requests for confirmation of compliance with conditions associated with that permission should be made in writing or by using the application form 'Approval of Details Reserved by Conditions'.

A request may be for confirmation that one or more conditions imposed on the same permission have been complied with. We aim to respond within 8 weeks of receipt of the request.

Right of Appeal

If you are aggrieved by the decision to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under Section 78 of the Town and Country Planning Act 1990.

You must appeal within 12 weeks of the date of the decision notice for a householder application and within 26 weeks for other types of planning applications. Please note, only the applicant possesses the right of appeal.

The details of how to appeal together with the form which must be used can be obtained from the Planning Inspectorate at Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN (Tel: 0303 444 5000) or on-line at www.planningportal.gov.uk/pcs

Appendix C

Planning decision notice DC/15/2813 (28 April 2016)



Sarah Beuden
Savills
2 Charlotte Place
Southampton
Hampshire
SO14 0TB

Application Number: DC/15/2813

TOWN & COUNTRY PLANNING ACT, 1990 (as amended)
TOWN & COUNTRY PLANNING (Development Management Procedure) (England) Order 2015

On behalf of: Crest Nicholson Operations Ltd

In pursuance of their powers under the above-mentioned Act and Order the Council hereby notify you that they PERMIT the following development, that is to say:

Variation of conditions 3, 4, 7, 8, 9, and 10 of hybrid planning application DC/10/1612 to enable the reconfiguration of the neighbourhood centre, community facilities and open space

Holmbush Farm Landfill Site Crawley Road Faygate West Sussex

to be carried out in accordance with Application No. DC/15/2813 submitted to the Council on 21/12/2015 and subject to compliance with the plans/documents and conditions specified hereunder.

Dr Chris Lyons
Director of Planning, Economic Development & Property

Date: 28/04/2016

Part A: Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space.

- 1 Applications for the approval of reserved matters shall be made to the Local Planning Authority before 16th October 2023.

Reason: To comply with Section 92 of the Town and Country Planning Act 1990.

- 2 The development hereby permitted shall begin either before the expiration of five years from the date of this permission or before the expiration of two years from the date of the approval of the last of the reserved matters to be approved, whichever is the later.

Reason: To comply with Section 92 of the Town and Country Planning Act 1990.

- 3 The submission of reserved matters applications pursuant to this outline application shall demonstrate substantial compliance with the following parameter plans submitted as part of the Outline application to fix the development principles:-**

**Land Use Plan - Drawing No. 321 Revision ADD 06
Residential Density Plan - Drawing No. 322 Revision ADD 05
Buildings Height Plan - Drawing No. 361 Revision ADD 03
Pedestrian & Cycle Movement Plan - Drawing No. 352 Revision ADD 00
Vehicular Movement Plan - Drawing No. 351 Revision ADD 03
Landscape and Open Space Plan - Drawing No. 331 Revision ADD 00**

Reason: To enable the Local Planning Authority to control the development in detail and to ensure compliance with the Land West of Bewbush Joint Area Action Plan throughout the phased development of the applications site.

- 4 The phasing of the development hereby permitted shall be in substantial accordance with the phasing and order shown on drawing No. 421 Revision ADD 00 unless otherwise agreed in writing by the Local Planning Authority.**

Reason: To ensure the delivery of the development and the associated infrastructure as required by the Land West of Bewbush Joint Area Action Plan.

- 5 Approval of the details of the layout of the development, the scale of each building, the appearance of each building, access to and within the site and the landscaping of the development (hereinafter called "the reserved matters") shall be obtained from the Local Planning Authority in writing before the relevant phase or part phase of the development is commenced, other than the Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application. The development shall be carried out in accordance with the approved details.**

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990.

- 6 Plans and particulars submitted pursuant to condition 5, (except where already provided in connection with Phase 1), above shall include the following details:**

- i) any proposed access road(s) including details of horizontal and vertical alignment;**
- ii) the layout, specification and construction programme for (1) any internal roads not covered by (i) above, (2) footpaths, (3) parking and turning areas (including visibility splays) (4) cycle parking areas and (5) cycle storage facilities;**
- iii) The reserved matters application for landscaping referred to in condition (5) above shall include the following information:
Location of existing trees, hedges, shrubs and other vegetation.
The layout, character, structure and types of the proposed planting, together with an indicative schedule of planting species.
The layout and character of the proposed hardsurfacing areas together with an indicative schedule of materials
Details of any earthworks proposed, contours to be formed and representative cross/long-sections and**
- iii) Location of lighting for roads, footpaths and other areas.**

The reserved matters for landscaping details shall show integration with the other reserved matters.

Reason: To enable the Local Planning Authority to control the development in detail and to comply with Section 92 of the Town and Country Planning Act 1990.

- 7 Notwithstanding the details as set out in the submitted Design and Access Statement (dated July 2010), the Design and Access Statement Addendum (dated December 2015), a Design Brief for the Neighbourhood Centre, Station Square and Brook Crossing areas as shown in Figure A18.15 of the Design and Access Statement Addendum shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of Phase 3, other than remediation soil testing site clearance and earthworks approved as part of this application.

The detailed design principles within the Design Brief shall include:

Constraints
Topography
Landuse
Massing and building heights
Access and circulation
Parking
Public realm
Layout
Appearance
Phasing
A 3 dimensional spatial masterplan
Architectural, landscape and sustainable construction guidelines

The reserved matters applications pursuant to this permission shall demonstrate compliance with the Design Brief and shall reflect the visions of the submitted Design and Access Statement (dated July 2010), the Design and Access Statement Addendum (dated December 2015) and Landscape Strategy for the development. The development shall be carried out in accordance with the approved Design Brief.

Reason: To enable the Local Planning Authority to control the development in detail and to ensure compliance with the Land West of Bewbush Joint Area Action Plan throughout the phased development of the applications site.

- 8 Each phase or part phase of the development (excluding Phase 1) shall be accompanied by a statement of conformity with evidence to demonstrate that the design of the development is in substantial accordance with the vision/design principles/details of the Design and Access Statement (dated July 2010) and the Design and Access Statement Addendum (dated December 2015), the Strategic Design Code and the Design Brief approved by condition 7.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 9 Plans showing the structure and layout for each of the key open spaces within the development) which are identified on plan the Landscape and Open Space Plan Drawing No. 331 Revision ADD 00 (excluding open space within Phase 1) shall be submitted concurrently with the reserved matters for each phase or part phase in which the open spaces are located and approved in writing by the Local Planning Authority.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 10 For each phase or part phase of the development the key open spaces as identified on the Landscape and Open Space Plan Drawing No. 331 Revision ADD 00 (excluding open space within Phase 1) shall be laid out in accordance with the structure and layout approved by condition 9, and the structure, layout, facilities and equipment shall be provided in accordance with a timetable which shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of the relevant phase or part phase, other than remediation soil testing site clearance and earthworks and any related operations approved as part of this application. The development shall be carried out in accordance with the approved details and timetable.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 11 The development shall be carried out and thereafter be permanently retained in accordance with the overarching long term Landscape Management and Maintenance Plan details approved by letter dated 22nd January 2014 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 12 Prior to the occupation of any dwellings on each phase or part phase, a detailed management and maintenance plan, for areas of land within that phase or part phase, shall be submitted to and approved in writing by the Local Planning Authority clearly setting out future maintenance responsibilities for all areas of land within that phase or part phase. Each detailed management and maintenance plan shall be incorporated into, and demonstrate integration with the overarching Landscape Management and Maintenance Plan approved by condition 11 above, and shall include:

Detailed Management and Maintenance Prescriptions/Operations

Schedules of maintenance operations and their timing

A plan showing parties responsible for the maintenance of different areas and their contact details.

Each phase or part phase of the development shall thereafter be maintained in accordance with the approved Landscape Management and Maintenance plan, unless otherwise approved in writing by the Local Planning Authority.

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 13 Development within the areas shown red and yellow on the hybrid planning application component plan No. 248 Revision F shall be carried out and thereafter permanently retained in accordance with the detailed management and maintenance plan details approved by letter dated 22nd January 2014 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the foundations for the future maintenance and management of the landscaping and open space to secure the delivery of a high quality landscape and development as required by the Land West of Bewbush Joint Area Action Plan.

- 14 The landscaping scheme for the A264 landscape buffer; the A264 highway access; and the Phase 1 residential development shall be implemented in accordance with the details and timetable approved by letters dated 3rd October 2012, 16th April 2013 and 2nd July 2014

unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

- 15 No development of any phase or part phase shall begin, other than remediation soil testing site clearance and earthworks approved as part of this application, until a scheme for the provision and management of a buffer zone of at least 5 metres other than at pinch points alongside the watercourses shall be submitted to and agreed in writing by the Local Planning Authority. The buffer zone shall be clear of all buildings, structures, fences etc and hard standing, including formal footpaths and cycle paths. Thereafter the development shall be carried out in accordance with the approved scheme and any subsequent amendments shall be agreed in writing with the Local Planning Authority. The scheme shall include:

Implementation Plan

plans showing the extent and layout of the buffer zone, identifying the exact location of pinch points within the buffer zones (and the justifications for these), the design, widths, surface types and distances from the edges of the paths to the top of the banks, of all footpaths and cycle paths adjacent to watercourse
details of the planting scheme (for example, native species)
details demonstrating how the buffer zone will be protected during development and managed/maintained over the longer term

Reason: This planning condition is necessary to ensure the development complies with the principles of the NPPF, the UK BAP and Policy 31 of the Horsham District Planning Framework (2015).

- 16 No development, excluding Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application, shall take place until a scheme for the provision and management of compensatory habitat creation has been submitted to and agreed in writing by the Local Planning Authority and implemented as approved. Thereafter the development shall be implemented in accordance with the approved scheme.

Reason: This planning condition is necessary to ensure the development complies with the principles of the NPPF and Policy 31 of the Horsham District Planning Framework (2015).

- 17 No phase or part phase of the development shall commence until all existing trees/bushes/hedges to be retained within (and immediately adjacent to) that phase or part phase as approved pursuant to condition 5 above, have been protected by a fence erected in accordance with the guidance contained in BS 5837:2012 and maintained during the course of development within that phase or part phase. Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the Local Planning Authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: In order to adequate protection to existing trees and hedges prior to the development of the site in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 18 No trees, hedges or shrubs on the site, shall be wilfully damaged or uprooted, felled/removed, topped or lopped (without the previous written consent of the Local Planning Authority) until 5 years after completion of any phase or part phase of the development hereby permitted. Any trees, hedges or shrubs on the site, whether within the tree protective areas or not, which die or become damaged during the construction process shall be replaced with trees, hedging plants or shrubs of a type, size and in positions agreed by the

Local Planning Authority.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 19 Any plants which within a period of 5 years die, are removed, or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size and species unless the Local Planning Authority gives written consent to any variation.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 20 No development or preparatory works within 15m of the Ancient Woodland in Pondtail Shaw shall begin until a methodology has been submitted to and approved in writing by the Local Planning Authority to support the detailed applications detailing how the ancient woodland will be protected during the construction of the adjacent development, western bridge crossing and any other development within 15m. The development shall be carried out in accordance with the approved details.

Reason: To protect ancient woodland in accordance with Policy 31 of the Horsham District Planning Framework (2015), the NPPF and Section 40 of the Natural Environment and Rural Communities Act 2006.

- 21 a) The development shall be carried out in accordance with the overarching long term Ecological Management Plan details approved by letter dated 27th November 2013 unless otherwise agreed in writing by the Local Planning Authority.

b) A detailed Ecological Management plan shall be submitted as part of each reserved matters application and approved in writing by the Local Planning Authority and shall be incorporated into, and demonstrate integration with, the overarching Ecological Management Plan together with demonstrating compliance with the ecological mitigation set out in Chapter 10 of the Environmental Statement.

Each phase or part phase of the development shall thereafter be maintained in accordance with the approved overarching and detailed Ecological Management plan, unless otherwise approved in writing by the Local Planning Authority.

Reason: To accord with the Design and Access Statement (dated July 2010), the Design and Access Statement Addendum (dated December 2015), the NPPF, Policy 31 of the Horsham District Planning Framework (2015) and the Natural Environment and Rural Communities Act 2006.

- 22 No earthworks or recontouring associated with any phase or sub-phase shall begin until a scheme for the temporary drainage of that particular phase or sub-phase has been submitted to and approved in writing by the Local Planning Authority. The scheme shall subsequently be implemented in accordance with the approved details/timing embodied within the scheme and any subsequent amendments shall be agreed in writing with the Local Planning Authority.

The scheme shall also include:

demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period. measures to mitigate any increased risk of sediment entering the watercourses

Reason: To prevent the increased risk of flooding; to protect water quality. This planning condition is necessary to ensure the development complies with the principles of the NPPF.

- 23 No physical works affecting a watercourse within any phase or part phase shall begin until, a working method statement to cover all channel / bank works (to include realignment or culverting) of any watercourses shall be submitted to and agreed in writing by the Local Planning Authority. Thereafter the development shall be carried out in accordance with the approved scheme and any subsequent amendments shall be agreed in writing with the Local Planning Authority.

The scheme shall also include:

demonstration that there will not be a detrimental impact upon flood risk or the geomorphology of the watercourse.

Reason: To prevent a detrimental change in the flow conveyance of the watercourse, or increased risk of blockage which could lead to an increased risk of flooding and also to prevent an adverse impact upon the wildlife habitat. This planning condition is necessary to ensure the development complies with the principles of the NPPF and Policies 31 and 38 of the Horsham District Planning Framework (2015).

- 24 There shall be no raising of ground levels within the one per cent annual probability (1 in 100 year) flood extent, taking into account a suitable allowance for the potential impacts of climate change, without the prior written approval of the Local Planning Authority.

Reason: To prevent an increase in the impact of flooding through a reduction in the floodwater storage capacity, or flow conveyance of the floodplain in accordance with the NPPF and Policy 38 of the Horsham District Planning Framework (2015).

- 25 At the Reserved Matters stage for any phase or part phase (excluding Phase 1) a drainage strategy detailing any on and/or off site foul drainage works for that phase or part phase, shall be submitted to and approved in writing by the Local Planning Authority in consultation with the sewerage undertaker. No discharge of foul water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed. The development shall be carried out in accordance with the approved details.

Reason: The development may lead to sewage flooding; to ensure that sufficient capacity is made available to cope with the new development; and in order to avoid adverse environmental impact upon the community in accordance with the NPPF and Policy 38 of the Horsham District Planning Framework (2015).

- 26 The development shall be carried out and thereafter retained in accordance with the potable water infrastructure plans approved by letter dated 3rd October 2012 unless otherwise agreed in writing (by way of a formal application for such) by the Local Planning Authority.

Reason: To ensure that the existing infrastructure meets the needs of the development in accordance with Policy 38 of the Horsham District Planning Framework (2015).

- 27 At the Reserved Matters stage for any phase or part phase excluding Phase 1, a surface water drainage strategy for that phase or part phase based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the whole development, should be submitted to and approved in writing by the Local Planning Authority.

The strategy shall also include:

Details of how the sustainable drainage management train will be incorporated including a

number of water treatment stages

Details of how the drainage from the phase or part phase will discharge into the watercourse as proposed in section 15.3 of the approved Flood Risk Assessment (FRA) dated July 2010 (SLR Ref: 403-00404-00027).

Consideration of pollution prevention measures to protect watercourses and groundwater
Confirmation that there will be no discharge to ground in areas affected by contamination
Demonstration that the scheme complies with Advice Note 6 'Potential Bird Hazards from Sustainable Urban Drainage Schemes (SUDS)'.
Demonstration that flows through railway culverts will be restricted to pre-development rates or less.

The development shall be carried out in accordance with the details and any timings of the approved scheme. Any subsequent amendments shall be agreed in writing with the Local Planning Authority.

Reason: To prevent the increased risk of flooding, and ensure a management train is incorporated as agreed to improve and protect water quality, improve habitat and amenity, and ensure future maintenance of the drainage system. This planning condition is necessary to ensure the development complies with the principles of the NPPF and Policy 38 of the Horsham District Planning Framework (2015).

- 28 No development of any phase or part phase excluding Phase 1 shall begin, other than remediation soil testing site clearance and earthworks and any related operations approved as part of this application, until the following components of a scheme to deal with the risks associated with contamination of the site shall each be submitted to and approved, in writing, by the Local Planning Authority.

A preliminary risk assessment which has identified:

- all previous uses
- potential contaminants associated with those uses
- a conceptual model of the site indicating sources, pathways and receptors
- potentially unacceptable risks arising from contamination at the site.

A site investigation scheme, based on (1) to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

The site investigation results and the detailed risk assessment (2) and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be submitted to, and approved, in writing, by the Local Planning Authority. This shall include measures to deal with any contamination not previously identified but subsequently found to be present at the site.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed. This planning condition is necessary to ensure the development complies with the principles of the NPPF.

- 29 No occupation of any phase or part phase of the permitted development shall occur until a verification report demonstrating completion of the remediation works set out in the approved remediation strategy, and the effectiveness of the remediation for that phase or sub-phase

shall be submitted to and approved, in writing, by the Local Planning Authority. The report shall include results of sampling and monitoring carried out in accordance with the approved verification plan to demonstrate that the site remediation criteria have been met. It shall also include any plan (a "long-term monitoring and maintenance plan") for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action, as identified in the verification plan, and for the reporting of this to the Local Planning Authority. The long-term monitoring and maintenance plan shall be implemented as approved.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed. This planning condition is necessary to ensure the development complies with the principles of the NPPF.

- 30 Piling or any other foundation designs using penetrative methods shall not be permitted other than with the express written consent of the LPA, which may be given for those parts of the site where it has been demonstrated that there is no resultant unacceptable risk to groundwater.

Reason: Piling or other sources of ground penetration could create a pathway for contaminants to migrate into the groundwater. Preventative measures should be taken in order to protect groundwater quality. This planning condition is necessary to ensure the development complies with the principles of the NPPF.

- 31 No development on a phase or part phase shall commence until a programme of archaeological work including a Written Scheme of Investigation for that phase or sub phase has been submitted to and approved by the Local Planning Authority in writing. The scheme shall include research questions; and

The programme and methodology of site investigation and recording

The programme for post investigation assessment

Provision to be made for analysis of the archaeological archive arising from the site investigation and recording

Provision to be made for publication and dissemination of the findings of the site investigation and recording

Provision to be made for compilation and appropriate conservation of the archaeological site archive and insofar as may be reasonably practicable its deposition in an appropriate museum or publicly accessible repository

Nomination of a competent person or persons or organisation to undertake the works set out within the Written Scheme of Investigation.

No development shall take place other than in accordance with the approved Written Scheme of Investigation.

Reason: In order to ensure that archaeological features on the site will be properly recorded before and during development and that the records will be satisfactorily reported in accordance with Policy 34 of the Horsham District Planning Framework (2015).

- 32 No dwellings shall be constructed north of the railway line until the bridge over the railway, as illustrated on the parameter plans approved as part of this application, has been constructed. Details of the bridge shall be submitted to and approved in writing by the Local Planning Authority as part of a reserved matters application and the bridge shall be constructed in accordance with the approved details.

Reason: To ensure the delivery of a high quality accessible and integrated development as required by the Land West of Bewbush Joint Area Action Plan.

33 Prior to the commencement of each Phase or part Phase of the development (including Phase 1) a construction environmental management plan (CEMP) for that phase or part phase shall be submitted to the Local Planning Authority for its written approval and thereafter implemented and maintained throughout the construction period in accordance with the approved CEMP. The CEMP shall include:

Details of the working hours agreed with the Local Planning Authority for the implementation of the development;

Details of the design and location of the construction access;

Details of proposed wheel washing facilities located adjacent the construction site access;

Details of an area for the storage of materials, parking for construction traffic and an appropriate turning area has been provided within the site clear of the public highway;

A site waste management plan

Details of temporary utilities

How the construction will comply with the sustainable use of soils on construction sites.

Details of a communication strategy to include the provision of a dedicated phone line for residents to contact the site manager directly with complaints which should be manned at all times while site works are in progress.

Details of a routing agreement for the site construction traffic and HGV traffic associated with the movement of bulk material to and from the site;

Details of means of suppressing dust during the construction process to include the regime for dust deposition measurement at the site boundaries;

Details of the measures to mitigate the noise and vibration from construction including those measures identified in sections 13.5.1 to 13.5.4 of the Environmental Statement;

Details of a surface water drainage scheme for the temporary drainage of the Site. The scheme shall subsequently be implemented in accordance with the approved details.

The scheme shall include:

demonstration that there will be no increase in the volume or rate of surface water runoff leaving the site for the duration of the earthworks and associated stabilisation period.
measures to mitigate any increased risk of sediment entering the watercourses and groundwater.

demonstration that there will be no discharge to ground that has been affected by contamination

Measures for tree and hedgerow protection throughout the development programme;

A detailed method statement for the removal or long-term management/eradication of Japanese Knotweed on the site. The method statement shall include proposed measures to prevent the spread of Japanese Knotweed during any operations such as mowing, strimming or soil movement. It shall also contain measures to ensure that any soils brought to the site are free of the seeds/root/stem of any invasive plant covered under the Wildlife and Countryside Act 1981.

A detailed method statement for the construction of bridges to be submitted within the CEMP prior to the commencement of the relevant phase or sub-phase.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with Policies 31, 33 and 40 of the Horsham District Planning Framework (2015).

34 No dwelling within any phase or part phase of the development shall be occupied unless and until it has been provided with satisfactory parking arrangements in accordance with plans to be submitted and approved. The development shall be carried out in accordance with the approved details.

Reason: To prevent random parking taking place within the development in accordance with

Policies 40 and 41 of the Horsham District Planning Framework (2015).

- 35 The proposed bus gate links from the development to Sullivan Drive and Woodcroft Road as illustrated on Movement Parameter Plan Drawing No. 351 Revision ADD 03 shall be designed, laid out and constructed in all respects to a specification (which shall include safety audits and demonstration of the connectivity with the adjoining highway) to be submitted to and agreed by the Local Planning Authority.

The bus gate between the development and Sullivan Drive shall be provided by the occupation of the 900th dwelling and completed in accordance with the approved scheme.

The bus gate between the development and Woodcroft Road shall be provided by the occupation of the 1,650th dwelling and completed in accordance with the approved scheme.

Reason: In the interests of highway safety and to ensure the delivery of a high quality accessible and integrated development with pedestrian and public transport links in accordance with the Land West of Bewbush Joint Area Action Plan and Policy 40 of the Horsham District Planning Framework (2015).

- 36 No more than 350 of the dwellings hereby permitted shall be occupied until the completion of: the improvements to Junction 11 of the M23 shown on drawing number 16702-010-112C; or such other scheme of works to the highway substantially to the same effect, as may be approved in writing by the local planning authority (who shall consult with the Highways England on behalf of the Secretary of State for Transport).

Reason: To ensure that the M23 Motorway and the A23 Trunk Road continue to be an effective part of the national system of routes for through traffic in accordance with section 10 of the Highways Act 1980 and to satisfy the reasonable requirements of road safety in accordance with the NPPF.

- 37 No more than 800 dwellings hereby permitted shall be occupied until the completion of the improvements to Junction 11 of the M23 shown on drawing number 16702-010-111D; or such other scheme of works to the highway substantially to the same effect as may be approved in writing by the local planning authority (who shall consult with the Highways Agency on behalf of the Secretary of State for Transport).

Reason: To ensure that the M23 Motorway and the A23 Trunk Road continue to be an effective part of the national system of routes for through traffic in accordance with section 10 of the Highways Act 1980 and to satisfy the reasonable requirements of road safety in accordance with the NPPF.

- 38 No dwelling shall be constructed within any Phase or Part Phase of the development until a design assessment in respect of that dwelling has been submitted to and approved in writing by the Local Planning Authority. The assessment shall demonstrate the basis upon which the dwelling shall achieve at least Level 3 of the Code for Sustainable Homes or any other higher code level (or equivalent) required by national legislation as appropriate during the lifetime of the construction of the development. The design assessment shall include a water reduction strategy and shall demonstrate compliance with the Sustainability Statement submitted as part of this application. Each dwelling shall be constructed in accordance with the approved design assessment which relates to that dwelling. Unless otherwise approved in writing by the local planning authority, no dwelling hereby permitted shall be occupied unless a final Code Certificate certifying that at least Code Level 3 has been achieved (or the level required by national legislation at the time of construction), in respect of that dwelling, has been submitted to the local planning authority.

Reason: To secure the construction of sustainable homes in line with code level requirements at the time of construction in accordance with the vision as set out in the Land West of Bewbush Joint Area Action Plan.

- 39** Before the construction of any non-residential building hereby permitted is commenced a scheme for the achievement of a "very good" rating pursuant to the Building Research Establishment Environmental Assessment Method (or the equivalent rating of another such nationally recognised measure of sustainable construction), in respect of that building, shall have been submitted to and approved in writing by the Local Planning Authority. The scheme shall include a water reduction strategy and shall demonstrate compliance with the Sustainability Statement submitted as part of this application. Each non-residential building shall be constructed in accordance with the approved design assessment which relates to that building. No part of any non-residential building hereby permitted shall be occupied until a copy of a post - construction completion certificate, verifying that the building has achieved a "very good" rating (or equivalent), has been submitted to the Local Planning Authority.

Reason: To secure the construction of a sustainable development in accordance with the vision as set out in the Land West of Bewbush Joint Area Action Plan and Policy 37 of the Horsham District Planning Framework (2015).

- 40** The reserved matters application containing the Energy Centre area shall demonstrate that the plant meets BS4142 criteria of a rating level 10dB or more below background at the nearest dwelling, unless otherwise agreed in writing due to changing technology at the time.

Reason: To safeguard the amenities of future residents in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 41** No development shall begin on any phase or part phase, other than remediation soil testing site clearance and earthworks approved as part of this application, until a scheme of sound insulation works to provide sound attenuation against external noise to comply with the 'good' design range of 30 dB LAeq,T for indoor ambient noise levels as stated within BS 8233:1999 for that particular phase has been submitted to and approved in writing by the Local Planning Authority. The scheme as approved by the Local Planning Authority shall be fully installed prior to first occupation of each dwelling.

Reason: To safeguard the amenities of future residents in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 42** Prior to the occupation of any dwelling approved by this consent within or partly within the areas marked in yellow on Drawing Numbers 16702/SK003 and 16702/SK005, a bund shall be constructed in accordance with the approved verified design as shown in Drawing 16702-441-015 for dwellings west of the secondary access and Drawing 16702-441-016A for dwellings east of the secondary access.

Reason: To ensure that ambient noise levels are acceptable for those dwellings that without the bund in place would be likely to be subjected to unacceptable noise levels in accordance with the NPPF and Policy 33 of the Horsham District Planning Framework (2015).

- 43** No development, excluding Phase 1 and remediation soil testing site clearance and earthworks approved as part of this application, shall begin on any phase or part phase until full details of soft and water landscaping works have been submitted to and approved in writing by the Local Planning Authority, details must comply with Advice Note 3, 'Potential Bird Hazards from Amenity Landscaping and Building Design available at www.aoa.org.uk/publications/safeguarding.asp. These details shall include:

Any earthworks
Grassed areas

The species, number and spacing of trees and shrubs

Details of any water features

Drainage details including SuDS - such schemes must comply with Advice Note 'Potential Bird Hazards from Sustainable Urban Drainage Systems (SuDS)' available at www.aoa.org.uk/publications/safeguarding.asp

No subsequent alterations to the approved landscaping scheme are to take place unless submitted to and approved in writing by the Local Planning Authority. The scheme shall be implemented as approved.

Reason: To avoid endangering the safe movement of aircraft and the operation of Gatwick Airport through the attraction of birds and an increase in the bird hazard risk of the application site.

- 44 The development shall be implemented in accordance with the details of the Bird Management Plan approved by letter dated 3rd October 2012 and shall remain in force for the life of those water bodies. No subsequent alterations to the plan are to take place unless first submitted to and approved in writing by the Local Planning Authority.

Reason: It is necessary to manage the water bodies in order to minimise their attractiveness to birds which could endanger the safe movement of aircraft and the operation of Gatwick Airport.

- 45 All landscaping works, including SuDS details shall be carried out in accordance with the approved scheme. No alterations to the approved landscaping scheme are to take place unless submitted to and approved in writing by the Local Planning Authority.

Reason: The scheme has been designed to mitigate bird hazard and avoid endangering the safe movements of aircraft and the operation of Gatwick Airport through the attraction of birds.

- 46 Lighting schemes required during the construction and for the completed development shall be of a flat glass, full cut off design, mounted horizontally, and shall ensure that there is no light spill above the horizontal.

Reason: To avoid endangering the safe operation of aircraft through confusion with aeronautical ground lights or glare.

- 47 Unless otherwise agreed in writing by the Local Planning Authority in agreement with Gatwick Airport no buildings or structures associated with the development hereby permitted shall exceed the heights as shown on plan LGW1924 in metres Above Ordnance Datum AOD.

Reason: Development exceeding this height would penetrate the Obstacle Limitation Surfaces (OLS) surrounding Gatwick Airport and endanger aircraft movements and the safe operation of the aerodrome See Advice Note 1 'Safeguarding an overview ' for further information (available at www.aoa.org.uk/publications/safeguarding.asp).

Part B: Full planning permission for engineering operations associated with landfill remediation and associated infrastructure including pumping station.

- 48 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

- 49 The development associated with part b) shall be carried out only in accordance with the

details of Construction Environmental Management Plan approved by letter dated 3rd October 2012 unless otherwise agreed in writing (by way of a formal application for such) by the Local Planning Authority.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with Policies 31, 33 and 40 of the Horsham District Planning Framework (2015).

- 50 All existing trees/bushes/hedges to be retained within (and immediately adjacent to) any areas of works, shall be protected by a fence erected in accordance with the guidance contained in BS 5837:2012 and maintained during the course of development for part b). Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the local planning authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 51 A detailed scheme for temporary hydroseeding of the Knoll Park shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of the earthworks operations that will form the basic landform of the Knoll Park. The approved scheme shall then be implemented according to an agreed timescale to be submitted to and approved in writing with the Local Planning Authority.

Reason: To ensure no erosion of the Knoll Park feature occurs before the precise final landform details for the Knoll Park are agreed as part of a future reserved matters submission and implemented in accordance with Policies DC2 and DC9 of the Horsham District Local Development Framework, General Development Control Policies 2007.

Part C: Full permission for the development of Phase 1 of 291 dwellings, internal roads, garages, driveways 757 parking spaces, pathways, sub-station, flood attenuation ponds and associated amenity space.

- 52 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

- 53 Within a period of one month from the date of this permission a schedule of materials and samples of such materials and finishes and colours to be used for the external walls and roofs of the proposed building(s) shall be submitted to the Local Planning Authority for approval in writing. The external walls and roof materials used within Phase 1 of the development shall accord with those approved and the permanent hardstanding within Phase 1 shall only be carried out in accordance with the details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To enable the Local Planning Authority to control the development in detail in the interests of amenity by endeavouring to achieve a building of visual quality in accordance with Policy 33 of the Horsham District Planning Framework (2015).

54 The external walls and/or fences within Phase 1 shall be erected prior to the first occupation of the associated dwelling(s), and shall thereafter be retained in accordance with the details approved by letter dated 14th March 2014 unless otherwise agreed in writing by the Local Planning Authority.

Reason: In the interests of amenity in accordance with Policy 33 of the Horsham District Planning Framework (2015).

55 The storage of refuse/recycling bins shall be provided for prior to the first occupation of the associated dwellings(s), and shall thereafter be maintained in accordance with the details approved by letter dated 14th March 2014 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the adequate provision of recycling facilities in accordance with Policy 33 of the Horsham District Planning Framework (2015).

56 The street furniture and lighting within Phase 1 of the development hereby permitted shall only be installed in accordance with the timetable and details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: In the interests of amenity in accordance with Policy 33 of the Horsham District Planning Framework (2015).

57 The development shall be carried out in accordance with the underground services details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the underground services do not conflict with satisfactory development in the interests of amenity and to protect roots of important trees and hedgerows on the site in accordance with Policy 33 of the Horsham District Planning Framework (2015).

58 Finished floor levels for Phase 1 shall be constructed in accordance with plan no: 16702/441/PA/11 Revision B unless otherwise agreed in writing by the Local Planning Authority.

Reason: To reduce the risk of internal flooding to the development from any localised incidents on the watercourses on-site and in the interests of amenity and in accordance with Policy 38 of the Horsham District Planning Framework (2015). This planning condition is necessary to ensure the development complies with the principles the NPPF.

59 The Community Green (Gateway Village Green - Phase 1) shall be maintained in accordance with the details approved by letter dated 18th June 2013 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure the provision of open space to meet the needs of the development in accordance with an approved scheme in accordance with the NPPF and Policies 31, 32 and 33 of the Horsham District Planning Framework (2015).

60 The Neighbourhood Park (Phase 1) shall be laid out and thereafter retained in accordance with the scheme approved under application DISC/14/0067 (letter dated 2nd October 2014) unless otherwise agreed in writing (by way of a formal application for such) by the Local Planning Authority.

Reason: To ensure the provision of open space to meet the needs of the development in accordance with an approved scheme in accordance with the NPPF and Policies 31, 32 and 33 of the Horsham District Planning Framework (2015).

61 No trees, hedges or shrubs on the site, other than those the Local Planning Authority has agreed to be felled as part of this permission, shall be wilfully damaged or uprooted, felled/removed, topped or lopped without the previous written consent of the Local Planning Authority until 5 years after completion of the development hereby permitted. Any trees, hedges or shrubs on the site, whether within the tree protective areas or not, which die or become damaged during the construction process shall be replaced with trees, hedging plants or shrubs of a type, size and in positions agreed by the Local Planning Authority.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period, in accordance with Policy 33 of the Horsham District Planning Framework (2015).

62 The development within Phase 1 shall be fully implemented and thereafter permanently retained only in accordance with the drainage strategy details and timings approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To prevent an increased risk of flooding, improve and protect water quality, habitat and amenity and ensure the future maintenance of the drainage system in accordance with the principles of the NPPF.

63 The development within Phase 1 shall be fully implemented and thereafter permanently retained only in accordance with the drainage strategy detailing for on and off site foul drainage works approved by letter dated 3rd October 2012 unless otherwise agreed in writing (by way of a formal application for such) by the Local Planning Authority. No discharge of foul water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed in accordance with the approved details.

Reason: The development may lead to sewage flooding; to ensure that sufficient capacity is made available to cope with the new development; and in order to avoid adverse environmental impact upon the community in accordance with the NPPF and Policy 38 of the Horsham District Planning Framework (2015).

64 The development in Phase 1 as approved by this planning permission, shall be undertaken in compliance with the findings of the Preliminary Risk Assessment, Site Investigations and Remediation Strategy outlined in the following approved SLR reports:

Kilnwood Vale, Land Quality Assessment, SLR Ref 404-0404-00027, dated June 2010,
Version: Final

Kilnwood Vale Remediation Strategy SLR Ref 404-0404-00027, dated June 2010, Version:
Final

Any amendments or updates that are required to the approved preliminary Risk Assessment, Site Investigations and Remediation Strategy shall be submitted to and approved in writing to the LPA.

A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be submitted to, and approved, in writing, by the LPA prior to the occupation of phase 1. This shall include measures to deal with any contamination not previously identified but subsequently found to be present at the site.

The development shall be carried out in accordance with the approved details unless otherwise agreed in writing by the Local Planning Authority.

Reason: The site is a known historic landfill site, therefore any risk needs to be dismissed.

This planning condition is necessary to ensure the development complies with the principles of the NPPF.

- 65 Prior to occupation of any dwelling approved by this consent within or partly within the area marked in yellow on Drawing Numbers 16702/SK004 and 16702/SK006 a bund shall be constructed in accordance with the approved verified design as shown in drawing 16702-441-015.

Reason: To ensure that ambient noise levels are acceptable for those dwellings that without the bund in place would be likely to be subjected to unacceptable noise levels.

- 66 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (Amendment) (No2) (England) Order 2008 (or any order amending or revoking and re-enacting that Order with or without modification), no garages shall be erected [other than those expressly authorised by this permission].

Reason: In the interest of visual amenity and in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 67 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (Amendment) (No2) (England) Order 2008 (or any order revoking and re-enacting that Order with or without modification), no windows/dormer windows [other than those expressly authorised by this permission] shall be constructed.

Reason: To protect the privacy of adjoining properties and to protect the character and appearance of the building in accordance with Policy 33 of the Horsham District Planning Framework (2015).

- 68 Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) Order 1995 or Orders amending or revoking and re-enacting the same, the building(s) shall not be extended or altered in any way unless planning permission has been granted by the Local Planning Authority on application in that respect.

Reason: A more intensive use of the site would be likely to cause congestion on adjacent roads through overflow vehicle parking contrary to Policy 41 of the Horsham District Planning Framework (2015).

- 69 The building(s) hereby approved shall not be occupied until the parking turning and access facilities have been provided in accordance with the plans hereby approved (or in accordance with plans submitted to and approved in writing by the Local Planning Authority) and the parking turning and access facilities shall thereafter be retained solely for that purpose [and solely in connection with the development].

Reason: To ensure adequate parking, turning and access facilities are available to serve the development in accordance with Policy 40 of the Horsham District Planning Framework (2015).

- 70 No dwelling hereby permitted shall be occupied unless and until the access road to that dwelling has been completed to base course level with the road construction to be completed within 12 months of first occupation or to a later date to be agreed with the Local Planning Authority.

Reason: To ensure that the construction of the roads are of an adequate standard and meet the design code for the development in accordance with Policy 40 of the Horsham District Planning Framework (2015).

- 71 The temporary footpath/cyclepath route from Phase 1 providing connectivity to Chetwood

Drive, Bewbush shall be retained in accordance with the details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policy 40 of the Horsham District Planning Framework (2015).

- 72 A footpath/cyclepath route from Phase 1 providing connectivity to Chetwood Drive shall be designed, laid out and constructed to base course level and provided with street lighting by prior to the occupation of the 50th dwelling and completed to wearing course level prior to the occupation of the 100th dwelling. The scheme for the footpath/cycle path shall be in accordance with the details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policy 40 of the Horsham District Planning Framework (2015).

- 73 The footbridge located immediately south of plots 280-285 shall be fully constructed in accordance with the details approved under application DISC/14/0067 (by letter dated 2nd October 2014) prior to the occupation of plots 286-291, 280-285 and 274-279 and shall thereafter be retained in accordance with the approved details.

Reason: To ensure that the occupiers of Phase 1 are not isolated and have a safe walking and cycling route to local facilities and services in Bewbush in accordance with Policy 40 of the Horsham District Planning Framework (2015).

- 74 The development shall be carried out and thereafter retained in accordance with the details of inlet and outlet structures and retaining walls associated with the SuDS detention pond in Phase 1 approved by letter dated 3rd October 2012 unless otherwise agreed in writing (by way of a formal application for such) by the Local Planning Authority

Reason: To ensure the delivery of a high quality development as required by the Land West of Bewbush Joint Area Action Plan.

Part D: Full permission for the construction of a 3 to 6 metre high (above ground level) noise attenuation landform for approximately 700 metres, associated landscaping, pedestrian/cycleway and service provision (land known as Kilnwood Vale)

- 75 The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

- 76 The bund as approved by this application shall be maintained in accordance with the approved verified design as shown in Drawings 16702-441-015 and 16702-441-016A.

Reason: To ensure the performance of the bund is as tested by the Environmental Impact Assessment and to ensure that it reduces noise within the future development to acceptable levels in accordance with the NPPF.

- 77 The development shall be carried out only in accordance with the Construction Environmental Management Plan details approved by letter dated 3rd October 2012 unless otherwise agreed in writing by the Local Planning Authority.

Reason: In the interests of highway safety and ensuring the free flow of traffic on the highway network; to minimise the risk of damage to the highway; to safeguard the amenity of

existing and proposed residents; to ensure a strategy is in place to manage surface water drainage and safeguard existing watercourse and groundwater; to safeguard existing landscape features and secure the eradication of Japanese Knotweed in accordance with Policies 31, 33 and 40 of the Horsham District Planning Framework (2015).

- 78 All existing trees/bushes/hedges to be retained within (and immediately adjacent to) any areas of works, shall be protected by a fence erected in accordance with the guidance contained in BS 5837:2012 and maintained during the course of development for part d). Within the areas so fenced off the existing ground level shall neither be raised nor lowered and no materials, temporary buildings, plant, machinery or surplus soil shall be placed or stored within such areas without the prior written approval of the Local Planning Authority. If any trenches for services are required in the fenced off areas they shall be excavated and backfilled by hand and any tree root encountered with a diameter of 25mm or more shall be left unsevered.

Reason: To ensure the retention and maintenance of trees and vegetation on the site unsuitable for permanent protection by Tree Preservation Order for a limited period, in accordance with Policy 33 of the Horsham District Planning Framework (2015).

Plans and documents approved for Parts A, B, C and D:

- 79 301 Site Location Plan revision A received 25 October 2010
137 Site Plan revision L received 25 October 2010
248 Hybrid Application Component Plan revision F received 25 October 2010
- 305 Car Parking Plan revision C received 28 June 2011
SL-01 Overall Site Layout Phase 1 revision U received 6 June 2011
MAT-01 External Materials and Finishes Phase1 revision D received 28 June 2011
SE.01 Illustrative Street Elevations (Forms and Materials) revision D received 30 August 2011
SE.02 Illustrative Street Elevation (Forms and Materials) revision D received 30 August 2011
- A1-01 House type A1 - Floor Plans revision F received 18 April 2011
A1-02 House type A1 - Elevations revision F received 18 April 2011
A2-01 House type A2 - Floor Plans revision D received 30 July 2010
A2-02 House type A2 - Elevations revision F received 30 July 2010
A3-01 House type A3 - Floor Plans revision F received 18 April 2011
A3-02 House type A3 - Elevations revision E received 30 July 2010
A3-03 House type A3 - Elevations revision C received 18 April 2011
A3-04 House type A3 - Elevations revision B received 30 July 2010
A3(1)-01 House type A3(1) Floor Plans revision A received 30 July 2010
A3(1)-02 House type A3(1) Elevations revision B received 30 July 2010
A3(1)-03 House type A3(3) Elevations revision B received 30 July 2010
A4-01 House type A4 - Floor Plans revision E received 30 July 2010
A4-02 House type A4 - Elevations revision E received 30 July 2010
A4-03 House type A4 - Elevations revision B received 30 July 2010
A4-04 House type A4 - Elevations revision B received 30 July 2010
A4(1)-01 House type A4(1) - Floor Plans revision A received 30 July 2010
A4(1)-02 House type A4(2) -Elevations revision A received 30 July 2010
A4(1)-03 House type A4(3) - Elevations revision A received 30 July 2010
AF1-01 Flat type AF1 - Ground Floor Plan revision F received 30 July 2010
AF1-02 Flat type AF1 - First Floor Plan revision G received 30 July 2010
AF1-03 Flat type AF1 - Second Floor Plan revision G received 30 July 2010
AF1-04 Flat type AF1 - Front Elevation revision F received 30 July 2010
AF1-05 Flat type AF1 - Side Elevation revision E received 18 April 2011
AF1-06 Flat type AF1 - Rear Elevation revision G received 18 April 2011
AF1-07 Flat type AF1 - Side Elevation revision F received 30 July 2010

AF3-01 Flat type AF3 - Ground Floor Plan revision F received 30 July 2010
AF3-02 Flat type AF3 - First Floor Plan revision F received 30 July 2010
AF3-03 Flat type AF3 - Second Floor Plan revision F received 30 July 2010
AF3-04 Flat type AF3 - Front, Side Elevation revision E received 30 July 2010
AF3-05 Flat type AF3 - Rear, Side Elevation revision C received 30 July 2010
HC-01 House Type C Floor Plans revision F received 30 July 2010
HC-02 House Type C Elevations revision G received 30 July 2010
HC1-01 House Type C1 Floor Plans revision B received 18 April 2011
HC1-02 House Type C1 Elevations revision D received 18 April 2011
HC2-01 House Type C2 - Plot 21 Floor Plans revision C received 8 February 2011
HC2-02 House Type C2 - Plot 21 Elevations revision D received 8 February 2011
HC3-01 House Type C3 Floor Plans revision G received 30 July 2010
HC3-02 House Type C3 Elevations revision E received 30 July 2010
HD-01 House Type D Floor Plans revision G received 30 July 2010
HD-02 House Type D Elevations revision G received 30 July 2010
E-01 House Type E Floor Plans revision E received 30 July 2010
E-02 House Type E Elevations revision F received 30 July 2010
HG-01 House Types G & G1 Floor Plans revision F received 30 July 2010
HG-02 House Types G & G1 Elevations revision G received 30 July 2010
HG2-03 House Type G2 Floor Plans revision B received 30 July 2010
HG2-04 House Type G2 Elevations revision C received 30 July 2010
HH-01 House Type H Floor Plans revision H received 8 February 2011
HH-02 House Type H Floor Plans revision C received 30 July 2010
HH-03 House Type H Elevations revision J received 8 February 2011
HH1-01 House Type H1 Floor Plans revision H received 8 February 2011
HH1-02 House Type H1 Elevations revision H received 30 July 2010
HH2-01 House Type H2 Floor Plans revision C received 30 July 2010
HH2-02 House Type H2 Elevations revision C received 30 July 2010
HJ-01 House Type J Floor Plans revision F received 30 July 2010
HJ-02 House Type J Elevations revision F received 30 July 2010

HLL1-01 House Types L & L1 Floor Plans revision E received 30 July 2010
HLL1-02 House Types L & L1 Elevations revision D received 30 July 2010
HM-01 House Type M Floor Plans revision H received 30 July 2010
HM-02 House Type M Elevations revision G received 30 July 2010
HN-01 House Type N Floor Plans revision H received 8 February 2011
HN-02 House Type N Elevations revision H received 8 February 2011
HN-03 House Type N Elevations revision G received 30 July 2010
HP-01 House Type P Floor Plans revision E received 8 February 2011
HP-02 House Type P Elevations revision G received 8 February 2011
HP1-01 House Type P1 Floor Plans revision E received 11 August 2011
HP1-02 House Type P1 Elevations revision E received 8 February 2011
HR-01 House Type R Floor Plans revision H received 30 July 2010
HR-02 House Type R Elevations revision F received 30 July 2010
HS-01 House Type S Floor Plans revision J received 18 April 2011
HS-02 House Type S Elevations revision G received 8 February 2011
HS1-01 House Type S1 Floor Plans revision E received 8 February 2011
HS1-02 House Type S1 Elevations revision G received 8 February 2011
F1-01 Flat Type F1 Ground Floor Plan revision D received 30 July 2010
F1-02 Flat Type F1 First Floor Plan revision D received 30 July 2010
F1-03 Flat Type F1 Second Floor Plan revision D received 30 July 2010
F1-04 Flat Type F1 Elevation 1 revision F received 30 July 2010
F1-05 Flat Type F1 Elevation 2 revision F received 30 July 2010
F1-06 Flat Type F1 Rear & Side Elevations revision F received 30 July 2010
F2-01 Flat Type F1 Ground Floor Plan revision E received 30 July 2010
F2-02 Flat Type F2 First Floor Plan revision D received 30 July 2010
F2-03 Flat Type F2 Second Floor Plan revision D received 30 July 2010

F2-04 Flat Type F2 Front Elevation revision E received 30 July 2011
F2-05 Flat Type F2 Rear & Side Elevations revision E received 30 July 2011
F3-01 Flat Type F3 Ground Floor Plan revision F received 8 February 2011
F3-02 Flat Type F3 First Floor Plan revision F received 8 February 2011
F3-03 Flat Type F3 Second Floor Plan revision F received 8 February 2011
F3-04 Flat Type F3 Elevations revision F received 8 February 2011
F3-05 Flat Type F3 Elevations revision F received 8 February 2011
GC-01 Single Garage/Cycle Store 1 Floor Plans/Elevations received 30 July 2010
GC-02 Double Garage/Cycle Store 2 Floor Plans/Elevations received 30 July 2010
GC-03 Double Garage/Cycle Store 3 Floor Plans / Elevations received 30 July 2010
G-02 Double Garage Floor Plans / Elevations received 30 July 2010
G-03 Triple Garage / Cycle Store Floor Plans / Elevations received 30 July 2010
G-04 Garages/Cycle Store Type A Floor Plans / Elevations received 30 July 2010
G-05 Garages/Cycle Store Type B Floor Plans / Elevations received 30 July 2010
G-06 Bin/Cycle Store Floor Plans / Elevations received 30 July 2010
G-07 Drive through/Garage Floor Plans / Elevations received 30 July 2010
G-08 Car Port Floor Plans / Elevations received 30 July 2010
G-09 Quadruple Garage Floor Plans / Elevations received 30 July 2010
G-10 Bin/Cycle Store Floor Plans / Elevations received 30 July 2010
G-11 Car Ports received 18 April 2011

ECP 1 Existing Contour Plan revision 0 received 30 July 2010
PCP 1 Proposed Contour Plan revision 0 received 30 July 2010
EPP 1 Existing and Proposed Profile revision 0 received 30 July 2010
EP1 Earthworks Movement Plan - Phase 1 revision 0 received 30 July 2010
EP2 Earthworks Movement Plan - Phase 2 revision 0 received 30 July 2010
EP3 Earthworks Movement Plan - Phase 3 revision 0 received 30 July 2010

16702/010/111 M23 J11: Proposed Final Highway Layout revision D received 7 March 2011

16702/010/112 M23 J11: Proposed Interim Highway Layout revision C received 7 March 2011

16702/SK003 Kilnwood Vale, development area within Phase 2 2022 with development - daytime noise 2nd floor (worst case) contour with no bund ≥ 63 dB LAeq, 16hrs received 28 July 2011

16702/SK004 Kilnwood Vale, development area within Phase 1 2022 with development - daytime noise 2nd floor (worst case) contour with no bund ≥ 63 dB LAeq, 16hrs received 28 July 2011

16702/SK005 Kilnwood Vale, development area within Phase 2 2022 with development - night time noise 2nd floor (worst case) contour with no bund ≥ 57 dB LAeq, 8hrs received 3 August 2011

16702/SK006 Kilnwood Vale, development area within Phase 1 2022 with development - night time noise 2nd floor (worst case) contour with no bund ≥ 57 dB LAeq, 8hrs received 3 August 2011

16702-441-015 Kilnwood Vale Crawley noise bund parameters position and height of bund crest, sheet 1 of 2, received 23 June 2011

16702-441-016 Kilnwood Vale Crawley noise bund parameters position and height of bund crest, sheet 2 of 2, revision A received 23 June 2011

16702/441/007 Road & Street Lighting, Lighting Classes revision A received 30 July 2011

16702/441/R04/01 General Arrangement revision A received 30 July 2010
16702/441/R04/02 Alignment revision A received 23 June 2011
16702/441/R04/03 Geometry and Visibility revision B received 7 February 2011
16702/441/R04/04 Roundabout Layout - Deflection revision A received 30 July 2010
16702/441/R04/05 Vehicle Swept Path Analysis revision A received 30 July 2010
16702/441/R04/06 Vehicle Swept Path Analysis revision A received 30 July 2010
16702/441/R04/07 Traffic Signals revision A received 30 July 2010
16702/441/R04/08 Road Lighting revision A received 30 July 2010
16702/441/R04/09 Traffic Signs, Landscaping and Street Furniture revision A received 30 July 2010
16702/441/R04/10 Road Restraint Risk Assessment revision C received 7 February 2011
16702/441/R04/11 Noise Mitigation revision A received 30 July 2010
16702/441/R04/12 DMRB Standards - Relaxations and Departures revision A received 30 July 2010
16702/441/R04/13 Future Relief Road Gyrotory revision A received 30 July 2010

16702/441/PA/01 Phase 1: A264 Accesses revision A received 11 August 2011
16702/441/PA/02 Whole Site: Illustrative Bus Gate Plan revision A received 30 July 2010
16702/441/PA/03 Phase 1: Visibility revision C received 4 August 2011
16702/441/PA/04 Phase 1: Vehicle Swept Path Analysis: Pantehnicon revision C received 4 August 2011
16702/441/PA/05 Phase 1: Vehicle Swept Path Analysis: Refuse Vehicle and Bin Collection Points revision E received 31 August 2011
16702/441/PA/06-01 Phase 1: Vehicle Swept Path Analysis: Bus and Cars sheet 1 revision B received 4 August 2011
16702/441/PA/06-02 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 2 revision B received 4 August 2011
16702/441/PA/06-03 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 3 revision B received 4 August 2011
16702/441/PA/06-04 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 4 revision B received 4 August 2011
16702/441/PA/06-05 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 5 revision B received 4 August 2011
16702/441/PA/06-06 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 6 revision B received 4 August 2011
16702/441/PA/06-07 Phase 1: Vehicle Swept Path Analysis: Bus and Cars Sheet 7 revision B received 4 August 2011
16702/441/PA/07 Phase 1: Highways Horizontal Alignment revision B received 4 August 2011
16702/441/PA/08 Phase 1: Highway Vertical Alignment revision B received 4 August 2011
16702/441/PA/09 Phase 1: Street & Parking Court Lighting revision C received 4 August 2011
16702/441/PA/10 Site Access: Street Lighting revision B received 4 August 2011
16702/441/PA/11 Phase 1: Finished Floor Levels revision B received 4 August 2011
16702/441/PA/12 Phase 1: Foul & Surface Water Drainage revision D received 4 August 2011
16702/441/PA/13 Whole Site: Sub Station Details revision A received 30 July 2010
16702/441/PA/14-01 Utility Infrastructure Plan & Existing Services revision B received 7 February 2011
16702/441/PA/14-02 Utility Infrastructure Plan & Existing Services revision A received 30

July 2010

16702/441/PA/15 Phase 1: Bewbush Footpath/ Cycle Path & Bridleway Link revision D received 7 February 2011

16702/441/R05 Whole site and Phase 1 Utility Report revision A received 30 July 2010

16702/441/R06 Phase 1 Street Lighting Report revision A received 30 July 2010

16702/441/R04 Design Statement A264 Site Access revision A received 30 July 2010

16702/441/R004 Addendum - Design Statement A264 Site Access Section 3 & Appendix D - output from RRRAP, revision C received 7 February 2011

0404.00027.16.DT.001 Proposed Sections - Gateway / A264 Bund (Sheet 1 of 2) revision 4 received 3 August 2011

0404.00027.16.DT.002 Proposed Sections - Gateway / A264 Bund (Sheet 2 of 2) revision 2 received 3 August 2011

0404.00027.16.DT.003 Proposed Sections - A264 Bund East (Sheet 1 of 2) revision 2 received 3 August 2011

0404.00027.16.DT.004 Proposed Sections - A264 Bund East (Sheet 2 of 2) revision 2 received 3 August 2011

0404.00027.16.DT.005 Proposed Sections - Phase 1 SuDS Pond (Sheet 1 of 3) revision 1 received 30 July 2010

0404.00027.16.DT.006 Proposed Sections - Phase 1 SuDS Pond (Sheet 2 of 3) revision 1 received 30 July 2010

0404.00027.16.DT.007 Proposed Sections - Phase 1 SuDS Pond (Sheet 3 of 3) revision 1 received 30 July 2010

0404.00027.16.DT.008 Proposed Sections - Gateway Village Green / Duck Pond revision 1 received 30 July 2010

0404.00027.16.DT.009 Proposed Sections - Western Boundary (Phase 1) received 7 February 2011

0404.00027.16.DT.050 Boundary Details - Rear Gardens (Sheet 1 of 2) revision 1 received 30 July 2010

0404.00027.16.DT.051 Boundary Details - Rear Gardens (Sheet 2 of 2) revision 1 received 30 July 2010

0404.00027.16.DT.052 Boundary Details - Garden Gates and Driveway Gates revision 2 received 7 February 2011

0404.00027.16.DT.053 Boundary Details - Feature Walls revision 2 received 7 February 2011

0404.00027.16.DT.054 Boundary Details - 1.4m High timber post and rail fencing (to semi-private areas) revision 2 received 7 February 2011

0404.00027.16.DT.055 Boundary Details - 1.2m High timber post and wire with top and bottom rail (to NW Phase 1 - temporary) revision 1 received 7 February 2011

0404.00027.16.DT.056 Boundary Details - 1.4m High timber post and wire with top with wire mesh panels (to western boundary) received 7 February 2011

0404.00027.16.SS.001 Existing Site Survey Overview revision 1 received 30 July 2010

0404.00027.16.SS.002 Existing Site Survey (Sheet 1 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.003 Existing Site Survey (Sheet 2 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.004 Existing Site Survey (Sheet 3 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.005 Existing Site Survey (Sheet 4 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.006 Existing Site Survey (Sheet 5 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.007 Existing Site Survey (Sheet 6 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.008 Existing Site Survey (Sheet 7 of 8) revision 1 received 30 July 2010

0404.00027.16.SS.009 Existing Site Survey (Sheet 8 of 8) revision 1 received 30 July 2010

0404.00027.16.TSP.001 Tree Survey Plan - Inset A revision 1 received 11 August 2011

0404.00027.16.TSP.002 Tree Survey Plan - Inset B revision 1 received 30 July 2011

0404.00027.16.TSP.003 Tree Survey Plan - Inset C & D revision 1 received 30 July 2011

0404.00027.16.TSP.004 Tree Survey Plan - Inset E revision 1 received 30 July 2011

0404.00027.16.TSP.005 Tree Survey Plan - Inset F revision 1 received 30 July 2011
0404.00027.16.TSP.006 Tree Survey Plan - Inset G revision 1 received 30 July 2011
0404.00027.16.TSP.007 Tree Survey Plan - Inset H revision 1 received 30 July 2011
0404.00027.16.TSP.050 Tree Constraints Plan - BS5837 Tree Survey received 11 August 2011

0404.00027.16.SO.001 Tree Felling / Retention / Protection Overview revision 2 received 7 February 2011
0404.00027.16.SO.002 Tree Felling / Retention / Protection (Sheet 1 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.003 Tree Felling / Retention / Protection (Sheet 2 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.004 Tree Felling / Retention / Protection (Sheet 3 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.005 Tree Felling / Retention / Protection (Sheet 4 of 14) revision 1 received 30 July 2011
0404.00027.16.SO.006 Tree Felling / Retention / Protection (Sheet 5 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.007 Tree Felling / Retention / Protection (Sheet 6 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.008 Tree Felling / Retention / Protection (Sheet 7 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.009 Tree Felling / Retention / Protection (Sheet 8 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.010 Tree Felling / Retention / Protection (Sheet 9 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.011 Tree Felling / Retention / Protection (Sheet 10 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.012 Tree Felling / Retention / Protection (Sheet 11 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.013 Tree Felling / Retention / Protection (Sheet 12 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.014 Tree Felling / Retention / Protection (Sheet 13 of 14) revision 2 received 7 February 2011
0404.00027.16.SO.015 Tree Felling / Retention / Protection (Sheet 14 of 14) received 30 July 2010

0404.00027.16.GA.050 General Arrangement Overview revision 4 received 7 February 2011
0404.00027.16.GA.051 General Arrangement (Sheet 1 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.052 General Arrangement (Sheet 2 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.053 General Arrangement (Sheet 3 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.054 General Arrangement (Sheet 4 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.055 General Arrangement (Sheet 5 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.056 General Arrangement (Sheet 6 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.057 General Arrangement (Sheet 7 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.058 General Arrangement (Sheet 8 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.059 General Arrangement (Sheet 9 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.060 General Arrangement (Sheet 10 of 14) revision 4 received 7

February 2011
0404.00027.16.GA.061 General Arrangement (Sheet 11 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.062 General Arrangement (Sheet 12 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.063 General Arrangement (Sheet 13 of 14) revision 4 received 7 February 2011
0404.00027.16.GA.100 Phase 1 Masterplan revision 1 received 7 February 2011

0404.00027.16.GA.210 Open Space Strategy and Phasing Plan revision D received 4 August 2011

0404.00027.16.PP.001 Proposed Planting Plan Overview revision 2 received 7 February 2011
0404.00027.16.PP.002 Proposed Planting Plan (Sheet 1 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.003 Proposed Planting Plan (Sheet 2 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.004 Proposed Planting Plan (Sheet 3 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.005 Proposed Planting Plan (Sheet 4 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.006 Proposed Planting Plan (Sheet 5 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.007 Proposed Planting Plan (Sheet 6 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.008 Proposed Planting Plan (Sheet 7 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.009 Proposed Planting Plan (Sheet 8 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.010 Proposed Planting Plan (Sheet 9 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.011 Proposed Planting Plan (Sheet 10 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.012 Proposed Planting Plan (Sheet 11 of 12) revision 2 received 7 February 2011
0404.00027.16.PP.013 Proposed Planting Plan (Sheet 12 of 12) revision 2 received 7 February 2011

403.0404.00027 Site Waste Management Plan received 30 July 2010

Housing Mix Schedule revision B received 30 July 2010
Kilnwood Vale Design and Access Statement received 30 July 2010
Kilnwood Vale Supplementary note to Design and Access Statement - February 2011 received 7 February 2011
Kilnwood Vale Design and Access Statement Addendum received December 2015
Kilnwood Vale Strategic Design Code received 30 July 2010
Kilnwood Vale Strategic Design Code Addendum received December 2015
Kilnwood Vale Planning Statement received 30 July 2010
Kilnwood Vale Planning Statement received December 2015
Kilnwood Vale Environmental Impact Assessment - Volumes 1, 2 and 3 including landscape and visual impact assessment photomontages received 30 July 2010
Kilnwood Vale Environmental Impact Assessment Addendum received December 2015
Kilnwood Vale Sustainability Statement received 30 July 2010
Kilnwood Vale Open Space Strategy received 30 July 2010
Arboricultural Survey received 30 July 2010
Gatwick Safeguarding Plan LGW1924 received 3 October 2011

Land Use Plan - Drawing No. 321 Revision ADD 06 received 12 April 2016
Residential Density Plan - Drawing No. 322 Revision ADD 05 12 April 2016
Buildings Height Plan - Drawing No. 361 Revision ADD 03 12 April 2016
Pedestrian & Cycle Movement Plan - Drawing No. 352 Revision ADD 00 12 April 2016
Vehicular Movement Plan - Drawing No. 351 Revision ADD 03 12 April 2016
Landscape and Open Space Plan - Drawing No. 331 Revision ADD 00 12 April 2016

Note to Applicant

Statement pursuant to Article 35 of the Town and Country Planning (Development Management Procedure) (England) Order 2015. The Local Planning Authority has acted positively and proactively in determining this application by assessing the proposal against all material considerations, including planning policies and any representations that may have been received and subsequently determining to grant planning permission in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.

Note to Applicant:

In making this decision the Council has had regard to the following policy(ies) from the National Planning Policy Framework and the Horsham District Planning Framework (2015):

NPPF1 NPPF4 NPPF6 NPPF7 NPPF8 NPPF10 NPPF11 HDPF1 HDPF2 HDPF3
HDPF7 HDPF10 HDPF11 HDPF24 HDPF25 HDPF26 HDPF31 HDPF32 HDPF33
HDPF37 HDPF38 HDPF39 HDPF40 HDPF41 HDPF43 WB01 WB02 WB03 WB04
WB05 WB08 WB09 WB12 WB14 WB18 WB19 WB20 WB25

Additional Information

Planning Permission - Important Provisos

If planning permission has been granted, please note that your Notice of Decision refers only to consideration of your proposal under the Town and Country Planning Acts. It is not a building regulations approval and does not mean that you can disregard other Acts of Regulations, or avoid any other legal obligations. Some of these obligations, of particular relevance to your proposal are referred to elsewhere in this note. Before you proceed with your proposal you should ensure that a Building Control application is not required, or has been submitted. The Building Control Department can be contacted on 01403 215151.

If this permission relates to new dwellings, commercial premises or other buildings which will require a new postal address you should contact the Council's Street Naming & Numbering Department as soon as possible or before work commences on site. Further details are available on the Street Naming page on the Council's website or alternatively e-mail streetnaming@horsham.gov.uk or telephone 01403 215139.

It must be stressed that the information included on this Notice of Decision may not include all your legal obligations, and it does not grant you rights to carry out works on or over lands, or to access land that is not within your control or ownership.

Compliance with the Approved Plans and Conditions

The development hereby approved must be implemented in accordance with the approved plans and any conditions set out in the Notice. Some of the conditions may specify that works are to be carried out, and/or details submitted and approved before all or part of the development is started. These will appear in the 'Pre Commencement Conditions' section of the Notice.

If works on implementing this permission is started without these requirements being fully met, the development may be unauthorised and the permission invalidated, and could lead to enforcement proceedings or in some cases to prosecution.

Amendments

Should alterations or amendments be required to the approved plans, it will be necessary to apply either under Section 96A of the Town and Country Planning Act 1990 for non material alterations, or under Section 73 of the Act for minor material alterations. An application must be made using the standard application form and you should consult with us, to establish the correct type of application to be made.

Monitoring

Horsham District Council monitors the implementation of planning permissions. Please be aware that monitoring officers may visit the application site at various stages of the development to ensure compliance with the approved plans and conditions.

Conditions Compliance

Requests for confirmation of compliance with conditions associated with that permission should be made in writing or by using the application form 'Approval of Details Reserved by Conditions'.

A request may be for confirmation that one or more conditions imposed on the same permission have been complied with. We aim to respond within 8 weeks of receipt of the request.

Right of Appeal

If you are aggrieved by the decision to refuse permission for the proposed development or to grant it subject to conditions, then you can appeal to the Secretary of State under Section 78 of the Town and Country Planning Act 1990.

You must appeal within 12 weeks of the date of the decision notice for a householder application and within 26 weeks for other types of planning applications. Please note, only the applicant possesses the right of appeal.

The details of how to appeal together with the form which must be used can be obtained from the Planning Inspectorate at Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN (Tel: 0303 444 5000) or on-line at www.planningportal.gov.uk/pcs

Appendix D

Kilnwood Vale Phase 2.3 Earthworks Specification (Campbell Reith, 2016d)

Confidential

Kilnwood Vale Phase 2.3

Earthworks Specification

For

Crest Strategic Projects

Project Number: 11950

October 2016

Campbell Reith Hill LLP
Friars Bridge Court
41-45 Blackfriars Road
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Kilwood Vale Phase 2.3

EARTHWORKS SPECIFICATION

Project Specification Revision Record

Date	Revision	Clause Revisions	Prepared By	Checked By
22/10/15	A		AED/SMB	JWC
07/10/16	B	App 6/12 3.0 App 6/13 1.5.32	SMB/EJB	AED
19/01/17	C	Reference to chemical testing. Issued 19-01-17	JWC	SMB

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT

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APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT
SERIES 600: EARTHWORKS SPECIFICATION REVISION

The Specification shall be the current version of the 'Manual Contract Documents For Highway Works Specification of Highway Works', produced by the Highways Agency, as amended and added to by the Appendices contained within this document.

Appendix No.	Title.
0/3	List of numbered appendices referred to in the Specification and included in the Contract
0/4	List of drawings included in the Contract
	PRELIMINARIES
1/5	Geotechnical Testing
	EARTHWORKS
6/1	Requirements for Acceptability & Testing of Earthworks Materials
6/2	Requirements for Dealing with Class U1B and U2 Unacceptable Materials
6/3	Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)
6/8	Topsoil
6/12	Instrumentation and Monitoring
6/13	Ground Improvement
6/14	Limiting Values for Harm to Human Health and Environment

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

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A list of Drawings is included below:

Drawing No.	Drawing Title
11950/CE320	PHASE 2.3 EARTHWORKS - PROPOSED LEVELS
11950/CE321	PHASE 2.3 EARTHWORKS - PROPOSED CONTOURS
11950/CE322	PHASE 2.3 EARTHWORKS - PROPOSED SECTIONS SHEET 1 of 2
11950/CE323	PHASE 2.3 EARTHWORKS - PROPOSED SECTIONS SHEET 2 of 2
11950/CE324	PHASE 2.3 EXCAVATION FORMATION LEVELS
11950/CE325	PHASE 2.3 TOP OF SURCHARGE LEVELS
11950/CE326	PHASE 2.3 LOCATION OF INSTRUMENTS
11950/CE327	PHASE 2.3 INDICATIVE SURCHARGE DESIGN
11950/CE328	PHASE 2.3 LOW PERMEABILITY LAYER TIE IN DETAIL
11950/CE329	PHASE 2.3 SURCHARGE SECTIONS 1/2
11950/CE330	PHASE 2.3 SURCHARGE SECTIONS 2/2
11950-SK53_S1	FILL IN AREAS OF STEEPENED MADE GROUND BATTER
11950/GIS103C	PHASE 2.3 PROPOSED ENVIRONMENTAL POST-EARTHWORKS VALIDATION AND MONITORING LOCATIONS

APPENDIX 1/5: GEOTECHNICAL TESTING

APPENDIX 1/5: GEOTECHNICAL TESTING

CLAUSE	WORK, GOODS OR MATERIAL	TEST	SOURCE APPROVAL (prior to placement and compaction in the works)	ROUTINE FREQUENCY (during placement and compaction in the works)	TEST CERTIFICATE	COMMENTS	
Series 600 Earthworks					Required		
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
	1	General Granular Fill	Grading (U) and UC	3 per source ⁽ⁱ⁾	1 per 1000m ³	Required for all tests	Refer to Table 6/1 of Appendix 6/1 for method of determining the OMC and MDD (separate notes apply to Forensic TOC test). Refer to Appendix 6/12 for method of Drum Tests. Refer to Notes beneath this Table for additional clarifications
			MC (U)	3 per source ⁽ⁱ⁾	1 per 250m ³		
			OMC/MDD (U) and Particle Density (U)	3 per source ⁽ⁱⁱ⁾	1 per 2000m ³ ⁽ⁱⁱ⁾		
			pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	3 per source ⁽ⁱ⁾	1 per 3000m ^{3(iv)}		
			Forensic TOC tests in accordance with CLAIRE RB17	3 per source (on same materials used in drum tests)	1 per 500m ³		
			Drum Test	3 per source	1 per 2500m ³		
			Chemical Analysis (U) ^(v)	3 per source	1 per 2500m ³		
	2	General Cohesive Fill	Grading (U)	3 per source ⁽ⁱ⁾	1 per 500m ³		
			Sedimentation Analysis by Pipette (U)	3 per source	1 per 5 Gradings		
			PL/LL (U)	3 per source ⁽ⁱ⁾	1 per 1000m ³		
MC(U)/MCV(U)			3 per source ⁽ⁱ⁾	1 per 250m ³			
Undrained Shear Strength using HSV			3 per source ⁽ⁱ⁾	As required in relation to 'Compaction of Fills' below.			

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL (prior to placement and compaction in the works)	ROUTINE FREQUENCY (during placement and compaction in the works)	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks						Required	
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
			OMC/MDD (U) and Particle Density (U)	3 per source ⁽ⁱⁱ⁾	1 per 2000m ³ ⁽ⁱⁱ⁾	Required for all tests	
			pH, Total SO ₄ , W/S SO ₄ , and Total S	3 per source	1 per 3000m ³ ^(iv)		
			Drum Test	3 per source	1 per 2500m ³		
			Chemical Analysis (U) ^(v)	3 per source	1 per 2500m ³		
			Forensic TOC tests in accordance with CLAIRE RB17	3 per source	1 per 500m ³		
		Permeability (U)	As per compaction Trial	N/A			
612	Compaction of Fills					Required for all tests.	Compaction Trial to be completed in accordance with App 6/3 and be witnessed by the Engineer. The final formation is to be additionally subjected to CBR determinations using plate load testing equipment. More tests may be required pending monitored performance.
			Field Dry Density (including air voids) (U) ⁽ⁱⁱⁱ⁾ & HSV.		1 per 35m x 35m grid per layer on placed and compacted materials.		
			Infiltration Rate(U) via Soakaway Test		1 per 100x100m And a minimum of 3 No per individual phase (e.g. 2.3)		
			Insitu CBR where used in top 2 layers of Engineered Fill. (U)		1 per 35m x 35m grid per layer on placed and compacted materials.		

Test Frequency Notes:

- (i) Where the source comprises materials that have been processed by the contractor at the point of final placement, the frequency is to be per 1000m³, per layer, or per day of earthworks (whichever gives the highest number of results). This may be modified by the Engineer where only small volumes of fill are placed and treated, for example where <300m³.
- (ii) Where the materials have been processed by the contractor at point of final placement, the tests indicated can be omitted in view of the requirements of item (iii) below.
- (iii) Where the materials have been processed by the contractor at the point of final placement, a sample of appropriate mass shall be taken [at the location of each in-situ density test] for a laboratory compaction test, determination of particle density and determination of moisture content. The laboratory compaction test procedure will be appropriate for the material type – refer to Appendix 6/1 and item 11 below for further information on the nature of the compaction tests required. The laboratory compaction test result will be used to establish the maximum dry density against which the % relative compaction (measured insitu) will be determined and presented. The insitu density test results, the particle density and the moisture content determination will be used to calculate the air voids ratio. The need for such testing is to be reviewed based on the Engineer's judgement of the Contractor's processing operation, visual assessment of how homogenous the processed material has become and on initial laboratory test results. The Engineer shall review how much consistency is being achieved in the processed material from the laboratory compaction tests, particle density and moisture content results and potentially reduce the need for the laboratory testing based on findings.
- (iv) To be revised to 1 per 1000m³ where the contractor intends to undertake modification or stabilisation using additives such as lime and/or cement.
- (v) The chemical analysis suite will be dictated by the proposed depth of the soils tested: for the upper 2.00m of final formation level the suite will comprise those determinants listed in the **Upper 2.00m Engineered Fill** column of Table 6/14 (11/04), Appendix 6/14. For fill placed beneath 2.00m below final formation level the suite will be restricted to asbestos quantification, as defined in Table 6/14 (11/04) but with 1 sample in every ten also analysed for the full suite (as listed the Upper 2.00m Engineered Fill column of Table 6/14 (11/04)).

General Notes:

- 1 With respect to Table 1/5, the column entitled 'Source Approval' relates to testing of the Contractor's proposed source material, prior to placement and compaction in the works, to provide confidence that it will be acceptable. The column entitled 'Routine Frequency', relates to testing materials on an on-going basis during placement and compaction in the works. Where source approval is specified, source testing shall be carried out at each source or stockpile used.
- 2 The column entitled 'Clause' in Table 1/5 is split into 2 sections: a section dealing with tests required in relation to CI 601, 631 to 637, 640 of the Specification for Highways Works and a section dealing with testing required in relation to CI 612 of the Specification Highway Works. The testing in relation to CI 601, 631, 637 and 640 is to ensure that materials are physically and chemically acceptable, and they are applicable to all soils to be used in the works. Testing in relation to CI 612 deals with testing required to ensure that End Product requirements are met. Soils for which the compaction requirement is End Product are detailed in Appendix 6/1.
- 3 Where End Product is required, a compaction trial as detailed in Appendix 6/3 CI 13.3 is to be undertaken to demonstrate that the End Products are achievable for each source of material and to give confidence that the contractor's method is appropriate.
- 4 (U) indicates that a UKAS test report or certificate is required.
- 5 All tests are to be undertaken in accordance with BS1377 unless otherwise stated.

- 6** pH, W/S SO₄, Total SO₄ and S tests are to be undertaken in accordance with methods prescribed in TRL Report 447.
- 7** Where HSV testing is to be undertaken to determine undrained shear strength, such tests are to be undertaken in accordance with the manufacturers user manual. The HSV is to be calibrated against the unconsolidated undrained shear strength laboratory triaxial test to BS 1377:Part 7, clause 8 on 100mm nominal diameter samples. Otherwise, shear strength testing requirements are to be as set out in Clause 633 of the Specification for Highway Works.
- 8** In addition to insitu CBR testing of the upper 2 layers of Engineered Fill, plate load tests (min 300mm dia. plate) are to be carried out in accordance with Chapter 7 of IAN 73/06 on the completed Earthworks Formation Level to demonstrate a minimum CBR value of 3% at the as constructed soil moisture content. Such testing is to be undertaken on a 70x70m grid, subject to modification once test results start to become available.
- 9** Forensic TOC analysis is to be undertaken on site won materials after they have been processed and in accordance with Claire Research Bulletin 17 (November 2012), Appendix C, whereby all constituents of the Made Ground are assessed and proportioned together with a TOC percentage for the fine soil fraction. It is noted that due to the nature of the test, each sample must weigh a minimum of 10kg and the exact weight shall be confirmed by the laboratory. The selected laboratory must be agreed 2 weeks in advance of any testing with the Engineer.
- 10** Drum Tests are a bespoke form of analysis which are intended to simulate soil conditions to inform the potential for ground gas production. They are also to be undertaken on site won materials after processing and are to be used to further assess and finesse the requirement for gas protection measures. Full details are provided in Appendix 6/12.
- 11** The method of compaction test is given in Appendix 6/1 for each material type. Compaction test certificates are to provide a graph of plotted points to illustrate Maximum Dry Density, Optimum Moisture Content and Air Voids. Air voids are to be based on measured particle densities. Particle densities shall be determined using a pycnometer or a gas jar, whichever is determined by the independent geotechnical testing laboratory as being most appropriate to the material type.
- 12** Field Dry Density determinations are to be either via Sand Replacement Density tests or Nuclear Density Gauges. For Nuclear Density Gauges the requirements of Appendix 6/3 Section 13.2 should be noted. The test must be taken to sufficient depth to ensure that the layer tested is fully penetrated. For End Product compaction density testing, nuclear surface density gauges shall be permitted so long as the calibration is deemed by the Engineer to be acceptable. Each instrument in use on the Contract shall be calibrated in accordance with BS 1377: Part 9. If nuclear density testing is selected, every twentieth determination shall be checked with a sand replacement test (BS1377: PART 9: 1990, Section 2). Nuclear density gauge determinations are not to be undertaken in soils rich in carbonaceous substances or rich in chalk. In such soils Sand Replacement Density tests are to be used.
- 13** Unless otherwise shown in this Appendix, tests and test certificates for works, goods or materials as scheduled under any one clause are required for all such work, goods or materials in the works.
- 14** Frequency of testing applies to each separate earthworks source within each of the earthworks material classes. The testing shall be distributed evenly throughout the materials placed.
- 15** Unless specifically instructed to the contrary, all samples used for testing materials to be incorporated into the works shall be taken from materials after they have been delivered to the site, (where imported) and in such case with 7 days notice to the Engineer so as to review requirements.
- 16** The Contractor will follow all the Specification Appendices for the form of all deliverables, storage of test records and storage of records of materials imported to and exported from site.

- 17** Definitions of abbreviations:
- § mc: natural moisture content;
 - § OMC: Optimum Moisture Content;
 - § MDD: Maximum Dry Density;
 - § HSV: Hand Shear Vane;
 - § W/S SO₄: Water Soluble Sulphate
 - § Total SO₄: Total Sulphate
 - § S: Total Sulphur
 - § Forensic TOC: Forensic Total Organic Carbon
- 18** For chemical analysis requirements refer to Appendix 6/14.
- 19** Moisture Condition Vale (MCV) testing may be used in lieu of moisture content (MC) testing provided that MCV is calibrated against MC and undrained shear strength (Cu) at a rate of 1 set of calibrations per day of compaction.
- 20** Laboratory permeability tests are to be undertaken on remoulded samples, compacted using a compaction apparatus appropriate to the material type as given in Appendix 6/1 and to be compacted to 95% maximum dry density. Testing is to be undertaken using triaxial equipment in accordance with BS1377 Part 6: 6. It is noted that this testing is related to the method trials rather than routine works.
- 21** In relation to all materials placed to form the permanent works, the co-ordinates of all sample and insitu test locations are to be surveyed and recorded based on the established grid to an accuracy of 1m. A unique layer number is to be recorded for all such samples/tests such that this can be correlated to survey data for each layer. Each layer of placed material is to be surveyed using topographical surveying techniques to an accuracy not worse than 25mm.
- 22** The Contractor may propose the use of additives to treat soil to so as ensure that the engineering characteristics of the soils used will meet with the requirements of Appendix 6/1 However, the use of Treated Fill shall not be permitted without prior written approval of the Engineer and prior approval of a treatment trial as detailed in Appendix 6/3. Where treated soils are used this must be reflected in the laboratory tests undertaken. For example the samples taken to facilitate the testing must relate to materials in their treated state or mixed in the lab with same additives, to the same proportion and with same degree of mixing. If trials and suchlike are required to understand the treatment process they shall be fully agreed in advance with the Engineer.
- 23** Infiltration rates are to be determined using soakaway tests. The tests are not be performed during periods of rainfall or when there is ponded water on the ground. These are to be undertaken in accordance with BRE Digest 365. They shall be undertaken by an AGS accredited ground investigation specialist contractor with their Method Statement agreed prior to works. The pit dimensions shall be a minimum of 1m wide 1m long and 1m deep (but shall not exceed 1.25m deep). It shall be assumed that the associated pit will need support during the test by backfilling with 10mm clean pea shingle, however, this can be omitted if it can be assured that the soakaway pit would otherwise remain stable throughout the test. A data logger is to be used to measure the water during test. Water must be added rapidly. The specialist ground investigation contractor is to provide full time supervision of such tests and is to provide a real time interpretation of the results.

The duration of the tests shall be such that it can be confirmed in the field the by the specialist subcontractor that the infiltration rate is less than 10^{-7} m/s. The Engineer shall be informed of the findings. The test can only be terminated once the Engineer has given his approval to do

so. The earthworks contactor and specialist shall work together so as to prevent water (other than that added to perform the test) from entering the excavation. Upon completion of the test any pea shingle and the water is to be fully removed and the excavation re-instated with materials placed and compacted in accordance with this specification so as to form Engineered Fill. The contractor shall provide a report on the soakaway testing, including details of the testing undertaken, the data from the test, the specialist contractor's interpretation and tests associated with the backfilling of the excavation

**APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF
EARTHWORKS MATERIALS**

1.0 Acceptable Limits for Fill Materials

1.1 Earthworks materials shall comply with the 600 series of the Highways Agency 'The Manual of Contract Documents for Highway Works, Volume 1: Specification for Highway Works' (SHW) and with the particular requirements of this Appendix. Permitted classes of construction materials are defined in Appendix 6/1, Table 6/1: Acceptable Earthworks Materials: Classification and Compaction Requirements.

1.2 All earthworks materials are to meet the acceptability limits as set out in Appendix 6/1, Table 6/1 and SHW Table 6/2.

1.3 Unacceptable Material Class U1A shall be:

- § material which does not comply with the permitted constituents and material properties of Table 6/1 and Appendix 6/1 for acceptable material;
- § peat, materials from swamps, marshes and bogs;
- § logs, stumps and perishable material;
- § potentially deleterious materials;
- § potentially degradable material that presents a future source of gas;
- § material that exceeds the Forensic TOC content limit of 4%;
- § materials in a frozen condition;
- § clay having a liquid limit determined in accordance with BS1377 : Part 2, exceeding 90% or plasticity index determined in accordance with BS1377 : Part 2, exceeding 65%;
- § material susceptible to spontaneous combustion; and
- § material contaminated with vegetative matter including invasive plant species.

1.4 Unacceptable material Class U1B shall be:

- as defined in SHW;
- contaminated, noxious or deleterious materials;
- asbestos containing material.

1.5 Fill materials will generally comprise:

- Class 2 to provide: Engineered Fill. Placed and compacted to meet the End Product requirements.
- Class 6 material: used for starter layers, sub-formations and working platform fill below water.

- 1.6 Material designated as Class U1A due to physical properties that fall outside those permitted in Appendix 6/1, Table 6/1, Table 6/2 may be physically processed and conditioned to obtain the appropriate classification.
- 1.7 Where possible U1A oversized materials are to be processed to meet the 'recycled aggregate' requirements of Clause 601.12 of SHW and the target acceptability limits as set out in Table 6/1, SHW Table 6/2 and site specific requirements.
- 1.8 When rendering Class U1A material acceptable by lime (quicklime) or another alternative agreed (e.g. ckd) the Contractor shall demonstrate that any swell/heave does not cause damage to overlying materials and that the finished surface remains within the specified tolerances. The method of spreading lime is to provide for a controllable rate of application, even spreading, and for the percentage lime added to be either directly measured or readily calculable. The Contractor is to be responsible for obtaining and keeping full and detailed records of where lime modified material has been incorporated within the works.

2.0 Special Requirements for Determining Acceptability, and Whether Sampling and Testing is Required

- 2.1 The Contractor shall carry out Acceptability and End Product Compaction Testing in accordance with Specification Appendix 6/1, Table 6/1 and at the frequencies given in Appendix 1/5 in a UKAS accredited testing laboratory. Each sample and in-situ test shall be identified by a unique identification number directly referenced to both the sample type, location and position.
- 2.2 Testing shall be the responsibility of the Contractor and be carried out in accordance with Specification Appendices 1/5, 6/1 and 6/3. The Contractor shall maintain full records on each sub-unit of materials, including but not limited to, the location of the sources, the suppliers details, the acceptability testing and the location it has been incorporated within the works. This also applies to Client sourced materials.
- 2.3 Should any material be placed which has not been given prior approval from the Engineer, the Contractor will have done this at its own risk and shall be responsible for any remedial works required to rectify the situation. In this regard, it is noted that the Engineer shall not be assumed to be present on site on Saturdays and works shall accommodate this. All costs associated with any remedial works or actions shall be borne solely by the Contractor.
- 2.4 The Contractor shall undertake testing of fill materials to determine their suitability to meet the compaction requirements given in this specification. A copy of the results of such testing shall be provided to the Engineer in paper hard copy and digital format (pdf, excel and AGS 3.1) within 10 days of testing being completed and prior to the materials being placed. All laboratory test results shall be submitted in full accordance with The Association of Geotechnical and Geo-environmental Specialists (AGS) version 3.1 standard (available on the AGS website: <http://www.ags.org.uk> under 'datatransfer'). Each AGS data file must be checked for errors (i.e. must not contain warnings, structural or integrity errors) before it is submitted and it must be accompanied by an error log file to verify.

3.0 Permitted Use of Rapid Assessment Procedure for Material Acceptability

- 3.1 Where moisture content is specified as the method of material classification and control, the Contractor may use a 'rapid' method as an alternative to the BS1377: Part 2 method provided that such 'rapid' methods are calibrated weekly against conventional BS methods using drying ovens.

- 4.0 Requirements for the Assessment of the Effects of Water Soluble (WS) Sulphate, Oxidisable Sulphides and Total Potential Sulphate in Accordance with TRL 447, Test Nos. 1 to 5**
- 4.1 Water soluble (WS) sulphate, oxidisable sulphides and total potential sulphate contents are to be determined in accordance with Clause 644 of SHW.

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			
						Lower	Upper		
GENERAL COHESIVE FILL	2 A - Wet cohesive material	General fill	Any material, or combination of materials other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: · an undrained shear strength of 50 kN/m ² or more · at least 95% Maximum Dry Density · not more than 5% air voids in top 2m. (Air voids can be relaxed to not more than 10% where used at a depth of >2m below the top of the Engineered Fill surface). · An infiltration rate and permeability of not more than 10 ⁻⁷ m/s · CBR 3% at as placed moisture content where used in top 2 layers of Engineered Fill. Where Hydraulic Binders are used maximum TPS is 1%.	2 A -
				(ii) Plasticity Index (PI)	BS 1377-2	N/A	N/A		
				(iii) mc	BS 1377-2	That associated with end product requirements as determined by testing			
				(iv) MCV	Clause 632				
				(v) Permeability of remoulded material	BS1377-5	-	10 ⁻⁷ m/s		
				(vi) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%		
				(vii) Chemical analysis	App 6/14	App 6/14			
				(viii) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14			
				(ix) Undrained shear strength of remoulded material.	Hand shear vane	50 kN/m ²	-		

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class			General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class				
2	B	-				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			Lower	Upper	2	B	-
2	B	-	Dry cohesive material	General fill	Any material, or combination of materials other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	2	B	-		
						(ii) Plasticity Index (PI)	BS 1377-2	N/A	N/A						
						(iii) mc	BS 1377-2	That associated with end product requirements as determined by testing							
						(iv) MCV	Clause 632								
						(v) Permeability of remoulded material	BS1377-5	-	10 ⁻⁷ m/s						
						(vi) Forensic TOC	Claire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%						
						(vii) Chemical analysis	App 6/14	App 6/14							
						(viii) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14							
						(ix) Undrained shear strength	Hand shear vane	50 kN/m ²	-						
2	C	-	Stony cohesive	General fill	Any material, or combination	(i) Grading	BS 1377-2	SHW	SHW Table	MDD determined using	2	C	-		

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			
						Lower	Upper		
	material		of materials other than material designated as Class 3 in the contract			Table 6/2	6/2	2.5kg Rammer.	
				(ii) Plasticity Index (PI)	BS 1377-2	N/A	N/A	Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	
				(iii) mc	BS 1377-2	That associated with end product requirements as determined by testing			
				(iv) MCV [where not possible to determine, acceptability shall be by (iii)]	Clause 632				
				(v) Permeability of remoulded material	BS1377-5	-	10 ⁻⁷ m/s		
				(v) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%		
				(vi) Chemical analysis	App 6/14	App 6/14			
				(vii) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14			
				(viii) Undrained shear strength	Hand shear vane	50 kN/m ²	-		
Class	General Material	Typical Use	Permitted Constituents	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and				COMPACTION REQUIREMENTS IN	Class

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class				
				Description		(All Subject to Requirements of Clause 601 and Appendix 6/1)	Testing in Clause 631				CLAUSE 612					
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:							
								Lower	Upper							
								Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:						
								Lower	Upper							
GENERAL COHESIVE FILL	2	D	-	Silty cohesive material	General fill	Any material, or combination of materials (excluding those listed in SHW Clause 6.1.2 (i) (b)) other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	2	D	-		
								(ii) Plasticity Index (PI)	BS 1377-2	N/A		N/A				
								(iii) mc	BS 1377-2	That associated with end product requirements as determined by testing						
								(iv) MCV [where not possible to determine, acceptability shall be by (iii)]	Clause 632							
								10 ⁻⁷ m/s	(v) Permeability of remoulded material	BS1377-5		-				
								(v) Forensic TOC	Cl:aire RB17 (Nov 2012)	-		Total combined Forensic TOC 4%				
								(vi) Chemical analysis	App 6/14	App 6/14						
								(vii) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14						
							(vii) Undrained shear strength of remoulded	Hand shear vane	50 kN/m ²	-						

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:					
									Lower	Upper				
				material										
Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:					
									Lower	Upper				
TOPSOIL	5	A	-	Topsoil, or turf, existing on site	Top soiling	Topsoil or turf designated as Class 5A in the Contract	(i) Grading	SHW Clause 618	-	SHW Clause 618	-	5	A	-
			ii) Properties as required by BS 3882				BS 3882	To meet with requirements given in BS 3882						
			iii) Chemical analysis				App 6/14	App 6/14						
			(iv) Asbestos screen and ID				UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14						
Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:					
									Lower	Upper				

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

				601 and Appendix 6/1)	Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:							
							Lower	Upper						
SELECTED GRANULAR FILL	6	A	-	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock, chalk or colliery spoil), blast furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	No compaction	6	A	-
							(ii) Uniformity coefficient	See note 5	10	-				
							(iii) Plasticity Index (PI)	BS 1377-2	Non-plastic					
							(iv) Chemical analysis	App 6/14	App 6/14					
							(v) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14					
	6	B	-	Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock, chalk or colliery spoil), blast	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	SHW Table 6/4 Method 5	6	B	-
							(ii) Plasticity Index (PI)	See note 5	10					

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class			
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:						
						Lower	Upper					
			furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	(iii) Chemical analysis	App 6/14	App 6/14 Threshold Concentration is dependent on depth – refer to Table 6/14						
				(iv) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964							
				(v) Los Angeles coefficient	SHW Clause 635	-	50					
6	C -	Selected uniformly graded	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock,	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	SHW Table 6/4 Method 3 OMC to be determined using Vibrating Hammer	6	C	-
					(ii) Uniformity	See note 5	-	10				

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			
						Lower	Upper		
	granular material		chalk or colliery spoil), blast furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	coefficient					
				(iii) Plasticity Index (PI)	BS 1377-2	Non-plastic			
				(iv) Chemical analysis	App 6/14	App 6/14			
				(v) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14			
				(vi) Los Angeles coefficient	SHW Clause 635	-	50		
				(vii) mc & OMC/MDD	BS 1377-2 & 4	OMC -2%	OMC +2%		

Footnotes to Table 6/1:

1. App = Appendix
2. Tab = Table
3. Where BS 1377:Part 2 is specified for MC, this shall mean BS 1377:Part 2 or BS EN 1097-5 as appropriate.
4. Uniformity coefficient is defined as the ratio of the particle diameters D60 to D10 on the particle-size distribution curve, where: D60 = particle diameter at which 60% of the soil by weight is finer and D10 = particle diameter at which 10% of the soil by weight is finer.
5. The Limiting Values for Class U1B material are given in Appendix 6/14. The contents of this table may be revised following periodic Engineering assessments and design by the Engineer.
6. Where supplementary clauses and tables are referenced in Table 6/1, they shall refer to the equivalent clause or table from the Manual of Contract Documents for Highway Works, Specification for Highway Works: Volume 1: (SHW).
7. Definitions of abbreviations:
 - mc: natural moisture content;
 - OMC: Optimum Moisture Content;
 - MDD: Maximum Dry Density;
 - HSV: Hand Shear Vane;
 - IDD: Intact Dry Density.
 - Forensic TOC: Forensic Total Organic Carbon

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

1 Requirements for Removal Off Site of Excavated Acceptable Material or Unacceptable Material Requiring Processing or Retention of Surplus Material On Site

- 1.1 Any surplus soils from Phase 2.3 shall be retained on the wider Phase 2&3 site in accordance with a: location plan; CEMP; MMP; and Environmental Permit approved by the Engineer to which the contractor shall fully accord. Where material cannot maintained in accordance with the above it shall be removed from site by the Contractor in accordance with current regulations.
- 1.2 If any Class U1B or U2 Material is identified at formation level the Engineer shall be notified and the Contractor shall prepare appropriate risk assessments to permit the completion of works. Thereafter the requirements detailed in 1.3 below shall apply and all materials shall be handled by the Contractor in accordance with Environment Agency Pollution Prevention guidance.
- 1.3 If visual or olfactory evidence of soil contamination is identified during the reduced level excavation works, the following actions shall be undertaken:
- work shall cease in the area of visual or olfactory contamination;
 - the area of concern shall be approximately delineated and clearly marked in order that personnel or equipment shall not be permitted to enter into the area of concern;
 - the soils of concern shall be inspected by the Engineer with suitable investigation equipment or operated mechanical excavator provided by the Contractor;
 - suitable samples of the soils of concern shall be recovered and submitted for laboratory testing;
 - suspected contaminated soils shall be excavated and suitably stockpiled in a clearly defined and segregated area whilst the results of laboratory testing are awaited, if required by the Engineer;
 - following receipt of the results of laboratory testing (between three to ten days thereafter, depending upon scope of testing required) the soils may be confirmed to be contaminated or of an unacceptable nature;
 - if soils are deemed contaminated or otherwise unacceptable, they shall be excavated under supervision of the Engineer and placed in a clearly demarked stockpile area pending either onsite treatment or offsite disposal;
 - validation samples of the soils that remain in the vicinity of the soils of concern shall be taken by the contractor under the direction of the Engineer;
 - following receipt of the results of the laboratory testing carried out on the soils that remain (between three to ten days thereafter, depending upon scope of testing required) excavation in this area can then proceed;
 - the results of site inspections, laboratory testing and actions taken shall be recorded by the Contractor as a record of the works carried out;
 - these records shall be compiled within the validation report for the Earthworks to provide a permanent record.

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

- 1.4 For the principle approach to stockpiling and materials movement refer to Section 8.0 and 9.0 of Appendix 6/3, noting that any particular provisions of the SHW shall notwithstanding apply. The requirements for environmental monitoring and protection shall be in accordance with the CEMP.
- 1.5 There is no requirement for the remediation of Unacceptable U1B material. However such material may potentially be re-classified by the Engineer. Any U1B material that fails the pre-requisite Limiting Values (Appendix 6/14) shall be referred to the Engineer for review and associated temporary stockpiles of material maintained. Unless specific approval for these materials is received from the Engineer these shall be considered U1B classification and removed. Any material that fails the Limiting Values shall not be imported to site without prior agreement of the Engineer.
- 1.6 All waste soils shall be removed and disposed of in accordance with the Waste (England and Wales) Regulations 2011 (as amended). All waste soils shall be tested and classified to permit Hazardous Properties Assessment and WAC testing in accordance with Environment Agency Guidance (WM3).

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

**APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION,
COMPACTION (OTHER THAN DYNAMIC COMPACTION)**

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

1.0 Earthworks General

- 1.1 Two weeks prior to work the contractor shall provide method statements for the works required to address this specification to the Engineer.
- 1.2 No ground disturbing activities, including any earthmoving activities, are to commence prior to the Contractor obtaining any necessary permits or licences including those relating to protected species or habitats. If a licence or permit for such works is granted, those works shall only be undertaken during the periods as stated on the licence or permit under the direction of the licence or permit holder. A copy of the licence and/or permit shall be provided to the Engineer prior to commencement of the relevant activities.
- 1.3 Setting out shall be carried out from established grid lines and maintained for the duration of the construction of the ground improvement. A minimum 10 x 10m inspection grid is required.
- 1.4 The following sequence of works is anticipated:
- Agree works Method Statements.
 - Set up permanent datum and other survey control stations.
 - Undertake compaction and treatment trials.
 - Excavate to Formation Level (refer to associated Sections and Drawings)
 - Identify the clay cap placed as part of the Phase 2.1 works and if preceded by the Phase 2.2 the clay cap placed as part of those works.
 - Proof roll and inspect excavation formation.
 - Complete surface monitoring and flux chamber tests (S3.0 and 4.0 of Appendix 6/12).
 - Complete Validation Trial Pits (S5.0 Appendix 6/12) – both geotechnical and gas related.
 - Remove any gaseous, soft or highly degradable materials.
 - Construct piezometers (Appendix 6/13).
 - Allow piezo readings to settle/become consistent and grout to cure.
 - Commence Drum Tests (S2.0 of Appendix 6/12).
 - Construct of Rod Settlement Gauges* (Appendix 6/13).
 - Commence monitoring in accordance with Appendix 6/13 Table 2.
 - Place/compact Engineered Fill, ensuring that the Engineered Fill placed as part of these works tie into those placed as part of the previous phases of works, especially with respect to any clay cap previously placed.
 - Place surcharge: extend full surcharge height 10m beyond the site boundary to the north and 5m beyond the Engineered Fill/natural tie in point (in the west of the site). The basal 250mm of the surcharge is to be constructed as Engineered Fill (Appendix 6/13).
 - Place gas monitoring installations (S1.0 of Appendix 6/12) and confirm any supplemental surface monitoring or flux chamber tests.
 - Remove surcharge after Engineer approval including continued monitoring and reporting in accordance with Appendix 6/13.
 - Grub out and decommission instruments: Place/compact Engineered Fill accordance with the Specification in areas of associated excavation.
 - Place/compact Engineered Fill to make up to final site level.
 - Test final site level (note other tests required as works progress).

* Rod Settlement Gauges are to be constructed at the Excavation Formation Level

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

- 1.5 If during excavation undisturbed competent natural ground is encountered then the excavation is to cease and the Engineer consulted for additional instructions. The Contractor shall provide a full level survey of the associated area.
- 1.6 Following initial formation level excavations, trial pits will be excavated, to inform the gas assessment and to inspect areas where the ground investigations have identified the presence of the 'poorest' material from a geotechnical point of view. The requirements are detailed in Appendix 6/12, section 5.0.
- 1.7 If unforeseen ground conditions or unforeseen responses to the treatment are encountered then the Engineer shall be verbally notified immediately (and within 48 hours in writing).
- 1.8 If Unacceptable Materials (class U1B/U2) are observed at the excavation formation then provision shall be made for these to be removed following instruction from the Engineer. Any associated 'hotspot' excavations shall be validated by the Contractor via the application of Forensic TOC tests comprising on composite sample per face and one composite sample from the base. Each spot will be surveyed to include base levels and lateral extents such that volumes can be calculated.
- 1.9 Surcharging operations and associated monitoring are detailed in Appendix 6/13.
- 1.10 Earthworks materials derived from processed Class U1B material are to be used in the works only when agreed with the Engineer. This shall be recorded in the As-Built Drawings.
- 1.11 The Contractor is responsible for the works covered by the Specification. The Contractor shall however require the inspection and approval of works from the Engineer subject to the notice periods presented in the Contract (and a minimum of 7 days) and in particular inspection of:
- a. Excavation formations
 - b. Classified stockpiles
 - c. Material placement and compaction (of permanent fills)
 - d. Unforeseen contamination (Class U1B / U2 Materials)
 - e. Validation trial pits
 - f. Completed works following removal of surcharge
 - g. Instrumentation and monitoring
- 1.12 A tracking system shall be established to the satisfaction of the Engineer to document material movements from excavation to segregation, stockpiling and eventual reuse. A reference grid shall be established to aid the control of material movements and shall be agreed with the Engineer prior to commencement. The proposed system shall be submitted to the Engineer 2 weeks in advance of its required use.
- 1.13 The tracking system shall enable location of placed materials in any one day in three dimensional space and locate in-situ and ex-situ test locations and levels. This will enable excavation and removal as necessary in the event that pre and/or post placement testing indicates that the soils are unsuitable and/or placement has not achieved the required state of compaction. The tracking system should also incorporate the requirements of the MMP which includes those soils moved off the Phase 2.2 site due to surplus requirements and/or unsuitability.

2.0 Control of Water

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

- 2.1 All works and associated costs relating to the control and management of water on site, from existing, proposed or redundant watercourses or from any other sources including groundwater, rainfall and surface water is the responsibility of and all costs are to be borne by the Contractor. Any uncertainty over the issues associated with water or groundwater control shall be submitted to the Engineer for clarification, as soon as any such issue is noted or identified by any party.
- 2.2 The Contractor shall provide for such measures as may be necessary to ensure that water, whether groundwater, from precipitation or any other source does not accumulate in excavations or on sub-grades, subject to licensing and permitting requirements. In addition, the Contractor shall ensure any adjacent areas, used to source material (subject to agreement) are graded so as to shed water away from the treated area.
- 2.3 The Contractor shall provide, where necessary, temporary watercourses, ditches, drains, pumping or other means of maintaining the earthworks free from water. Such provision shall include carrying out the work of forming the earthworks in such a manner that their surfaces have at all times a sufficient minimum cross-fall and, where practicable, a sufficient longitudinal gradient to enable them to shed water and prevent ponding. This shall include the provision of temporary measures to remove water expelled from the ground due to the application of load from the Engineered Fill and surcharge material.

3.0 Requirements for Groundwater Lowering or Other Treatment (where required)

- 3.1 The Contractor is responsible for all groundwater lowering where this is required for the purposes of the works. This is particularly relevant, but is not limited to, dewatering of deep excavations and trenches.
- 3.2 The Contractor is responsible for obtaining all permits and/or licences required to undertake groundwater lowering and for treatment and/or disposal of said groundwater or other encountered liquids.
- 3.3 Where earthworks operations or ground improvement measures result in the expelling of groundwater into drainage layers or onto earthworks surfaces the discharged water shall be collected, treated if necessary and disposed.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

4.0 Blasting for Excavation

4.1 Blasting for excavation is not a permitted alternative to normal excavation methods.

5.0 Stability of Excavation

5.1 Where the area to be filled comprises an existing excavation, the excavation shall be inspected and subsequently monitored by the Contractor, to ensure that there is no danger of its collapse during the works with consequences for safety, for existing buildings or for other construction adjoining. Shoring or propping shall be used where appropriate.

5.2 The Contractor shall provide appropriate barriers or other preventative measures around open excavations to minimise the health and safety risk to site users of these areas.

5.3 The Contractor shall ensure all temporary excavations are formed with suitable, safe batters or other suitable methods of support. The Contractor shall give notice without delay if any newly excavated faces are too unstable to allow work and take immediate action if instability is likely to affect structures, roadways, offsite land or the safety of the site operations.

6.0 Obstructions

6.1 An obstruction is deemed to be any material which is comprised principally of concrete, brick or stone, whether loose material or in a homogeneous form $>0.2\text{m}^3$. Where obstructions are encountered the Engineer shall be notified immediately. In ground conditions where breaking out is deemed necessary shall be carried out by a method and to a sequence agreed with the Engineer. All breaking out methods shall be carried out to the relevant professional standards.

6.2 Where encountered during the works, obstructions shall be removed to a minimum depth of 1m below the underside of the proposed excavation formation level. Where obstructions encountered in the works extend below this depth, they shall either be removed in their entirety, or cut down, surveyed and recorded if confirmed to be deep obstructions (e.g. piles). The preferred option shall be confirmed by the Engineer.

6.3 Where the obstruction extends beyond the boundary of any zone or area to be excavated, remediated and/or treated, the obstruction shall be removed 1m beyond the boundary except where this extends beyond the demise of the client's ownership or interferes with a permanent structure (such as adjacent building or footpath).

6.4 Where any obstruction to be removed extends beyond the demise of the client's ownership or interferes with a permanent structure, the obstruction shall be carefully removed up to the site demise in a way that causes no damage.

6.5 All obstructions discovered shall be marked on a set of the construction drawings indicating the position, extent and a description of the materials evident together with details of any residual obstructions left in. These details shall be made available to the Engineer. Prior to any filling, the Engineer shall be given the opportunity to decide if further works should be carried out beyond that specified. In the event of a residual obstruction being left insitu its location, extent and level are to be recorded by topographical surveying.

6.6 Where obstructions are broken out, filling or infilling of voids shall be deemed to be included with approved materials arising from the general works. Voids, pits, vents and the like shall be reported to the Engineer and shall be filled or capped with approved materials arising from the Works.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

6.7 The Contractor shall contact the Engineer before the disconnection and removal of any services comprising pipes, cables and general service installations discovered where they are above the Formation Level. These shall each be marked on a drawing and handed to the Engineer. The extent of any removal shall be within the plane of the works plus 1m where such service installations are discovered and are to be removed. The ends of any remnant pipework at the edge of any such excavation shall be cut and sealed.

7.0 Cutting Faces

7.1 No specific limitations or restrictions on undercutting are included, but the Contractor shall comply with his appointed Temporary Works Designer requirements when excavating trenches at or within the vicinity of the toe of any slopes.

7.2 Clearing loose material from cutting slopes by airline hose is not permitted.

7.3 The Contractor shall provide additional drainage measures to intercept and discharge seepages from cutting or embankment slopes. The Contractor is responsible for all drainage required to carry out the works and to protect them upon completion, which will include, where necessary, temporary drainage measures.

8.0 Segregation of Excavated Materials

8.1 During excavation, materials arising are to be inspected and segregated to Classes U1A, U1B, U2, 5A, General Fill Classes (and further segregation as may be required to ensure adequate control of compaction behaviour). Classes U1A, U1B, U2, 5A materials must be separated.

9.0 Stockpile Management

9.1 Where required, clearly defined segregated stockpiles are required for different sub-classes of processed material. The maximum permitted height of stockpiles, excluding topsoil Class 5, shall be 5.00m unless otherwise agreed with the Engineer. Stockpiles of different materials shall be clearly separated by a gap of not less than 5.00m.

9.2 Stockpiles of topsoil shall be formed in accordance with guidance provided by DEFRA '*Construction code of Practice for the Sustainable Use of Soils on Construction Sites (2009)*' and research carried out by non-statutory bodies, which suggests that optimum stockpiles of topsoil shall not exceed 1.3 m in height and that topsoil shall not be stockpiled for more than 1 year.

9.3 On completion of a stockpile the slopes shall be trimmed to falls to shed rain water and the surface sealed via compaction to limit infiltration. Temporary drainage shall be provided at the base of the stockpile to collect runoff from the stockpile and to carry any surface water away from the base of the stockpile.

9.4 The Contractor shall provide and maintain such measures as necessary to eliminate the production of dust from the stockpile during the its life.

Existing Stockpiles

9.5 The earthworks carried out for previous phases of the Kilnwood Vale development has resulted in the formation of various stockpiles of potentially suitable fill materials. The existing stockpiled materials may also be reused on Phase 2.3 provided they are subject to the testing as defined in Appendix 1/5 and meet the criteria given in Appendix 6/1.

9.6 The Contractor shall include details of the movement of these soils in the Materials Tracking documentation as detailed in Section 1.0 of Appendix 6/3.

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10.0 Geotechnical Soil Treatment

- 10.1 The Contractor shall provide moisture conditioning, modification and solidification/ stabilisation and physical treatment to render soils suitable under in accordance with Appendix 6/1, Table 6/1 and Table 6/2 .
- 10.2 Moisture conditioning is defined as works that may be required to ensure that stockpiled or as dug materials comply with the requirements of this specification and the Specification for Highways Works. These are processes where, either through the addition of chemicals such as lime, or through physical processes such as spreading out and air drying, the moisture content of the soils may be rendered suitable for earthworks.
- 10.3 The physical treatment of unacceptable materials is defined as physical screening/crushing of stockpiled or as-dug soils to remove timber, wood, potentially deleterious materials and oversized fragments of bricks, concrete and the like.
- 10.4 Rendering SHW Class U1A material acceptable by lime (quicklime) modification (or other additives) is permitted provided the modified material is able to meet the performance requirements given and that it or its method of placement do not result in a risk to the environment. The design of any such treatment shall be based on HA70/07 'Treatment of Fill and Capping Materials using either Lime or Cement or Both'. The Contractor shall demonstrate, to the satisfaction of the Engineer, that the treated materials do not have any significant potential to swell/heave. The method of spreading the additives is to provide a controllable rate of application and even spreading. It shall also enable the percentage of additives added to be either directly measured or readily calculable.
- 10.5 The Contractor shall be responsible for obtaining and keeping full and detailed records of where treated/modified material has been incorporated within the works.
- 10.6 Prior to undertaking any such soil treatment the Contractor shall submit full details to all relevant statutory authorities and the Engineer and obtain their approval to his proposals. The Contractor's attention is brought to the environmental sensitivity of the site and any such works must be undertaken in full compliance with the relevant statutory authority requirements and the requirements of the agreed Construction and Environmental Management Plan.

11.0 Water Courses

- 11.1 Details regarding existing water courses, construction of new water courses and earthworks drainage ditches are shown on the Drawings provided by the Engineer.
- 11.2 Redundant watercourses shall be drained and cleaned. Excavated arisings are to be treated as described in Appendix 6/2.

12.0 Construction of Fill

- 12.1 Engineered Fill: This is to comprise Class 2 material and must be compacted to achieve End Product requirements given in Appendix 6/1, Table 6/1 and as detailed below.
- 12.2 Surcharge Fill: This is a temporary fill to provide kentledge for the surcharge treatment. This can be Class 1 or Class 2 material. This is discussed in more detailed in Appendix 6/13.
- 12.3 Treated Fill: Site won fill that is treated using additives. The approved method of treatment, placement, mixing and compaction shall be informed by a trial. On-going testing types and frequency beyond those already required in Appendix 1/5 shall be agreed with the Engineer after review of trials to establish an appropriate methodology.

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- 12.4 Any material placed by the Contractor prior to the provision of full testing shall be at their risk. If fill material is to be screened, processed or treated after excavation, laboratory testing shall be required after the material has been processed in order to determine its suitability. Material will only be considered suitable, based on the results of the testing, if it is placed and compacted during a period of time in which the moisture content could not have varied outside of the appropriate range to meet the compaction requirements.
- 12.5 After materials have been brought up to final site levels where required, ground improvement via the use of a surcharge to preload the ground will then be undertaken as shown on the drawings. Full details of the surcharge operation are given in Appendix 6/13. Subsequent to the removal of the surcharge, site levels are then to be brought up by Engineered Fill materials which will be placed and compacted to meet End Product requirements. It is noted that the surcharge material does not generally have an End Product requirement, apart from the basal 250mm. The basal 250mm shall be placed and compacted as Engineered Fill to allow for settlement and the residual of this removed following surcharge completion.
- 12.6 Embankment slopes shall not be constructed steeper than that considered safe by the contractor's temporary works engineer. Temporary over-widening or steepening to achieve adequate compaction of the shoulders of the embankment are permitted.
- 12.7 Any sub-formation areas requiring protection against weather will be protected in accordance with Clause 608.9(ii) of SHW.
- 12.8 Formations for earthworks construction and cutting formations shall be proof-rolled using as a minimum, the compactive effort detailed in SHW Clause 613.11 and 613.12. This compactive effort shall be increased for cutting formations where different compactive efforts, dependent on the type of follow-on earthworks operations, are required by the Specification. Observations shall be made by the contractor to identify soft spots. The identification of a 'soft spot' is qualitative and depends on the response of the ground to the compactive effort during proof-rolling. As a minimum excessive matting, bow-waving or ground heave shall be indicative of a 'soft spot'. The Contractor shall agree with the Engineer the extent and nature of 'soft spot' treatment. The extent of the soft spot and associated treatment are to be recorded.
- 12.9 As part of the requisite compaction trials, consideration for dealing with soft spots shall be addressed and agreed with the Engineer.
- 12.10 The earthworks construction formations and cutting formations shall be inspected by the Engineer for the possible presence of any soils that have visual or olfactory evidence of contamination and/or the presence of any significant concentrations of organic or decayable material. The contractor shall agree with the Engineer on the course of action to be taken where such 'hot spots' are encountered.
- 12.11 Fill shall be placed and compacted in near-horizontal layers of the thickness required to achieve the required end product and shall, as far as practicable, be brought up at a uniform rate so that all parts of the site reach finished site level at the same time.
- 12.12 Where different thicknesses of fill material are to be employed, the thickness shall be benched to ensure that differential settlements are minimised.
- 12.13 No fill shall be placed and left uncompacted at the end of a working day. Compacted fill shall be sealed and graded to falls to ensure free runoff of rainwater without ponding.
- 12.14 Compaction plant and compaction method shall be selected having regard to the proximity of existing trenches, excavations, retaining walls, monitoring installations or other structures and

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all work shall be performed in such a way as to ensure that their existing stability is not impaired.

- 12.15 After removal of surcharge (Appendix 6/13) material exposed is to be proof rolled as per the compaction method used for the Engineered Fill.

13.0 Compaction

13.1 General

- 13.1.1 All materials shall be placed and compacted to achieve the associated End Product requirements as given in Appendix 6/1. The compaction techniques to be adopted for materials are to be informed by compaction trials as outlined below.

13.2 Use of Nuclear Density Gauges

- 13.2.1 For End Product compaction density testing, nuclear surface density gauges shall be permitted so long as the calibration is deemed by the Engineer to be acceptable. Each instrument in use on the Contract shall be calibrated in accordance with BS 1377: Part 9. If nuclear density testing is selected, every twentieth determination shall be checked with a sand replacement test (BS1377: PART 9: 1990, Section 2). Nuclear density gauge determinations are not to be undertaken in soils rich in carbonaceous substances or rich in chalk. In such soils Sand Replacement Density tests are to be used.

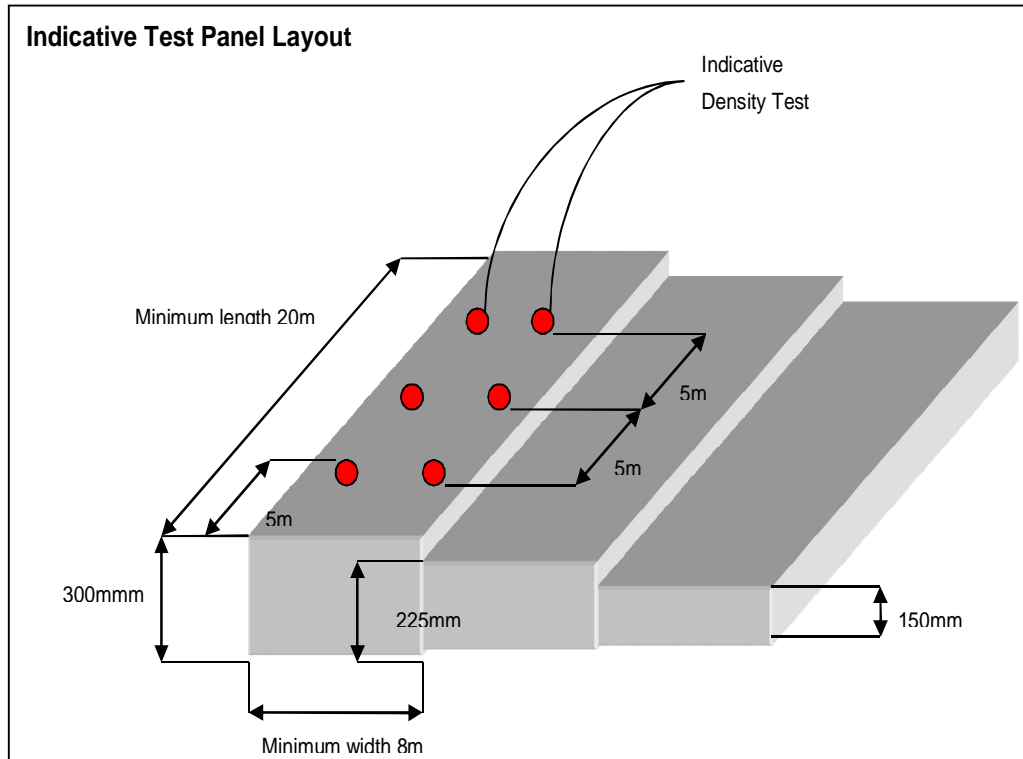
13.3 Compaction Trial For Engineered Fill

Initial Considerations

- 13.3.1 Compaction trials are required for each material source to be used in the main works and, in relation to such materials, for each compaction method to be used. Compaction trials shall be undertaken with the Engineer in attendance. Two week notice is to be provided and two weeks prior to the trial the Contractor shall provide the Engineer with the geotechnical and chemical results relating to the source material suitability testing. The contractor shall plan his works so as to ensure that compaction trial and associated testing and appraisal is complete in good time in advance of the main works. Failure to do so will result in materials being placed at the contractor's risk. The site of the trials shall be clearly marked and levels taken to determine the thickness of each layer before and after compaction.
- 13.3.2 The exception to the above is where the same materials have been placed and compacted in previous phases of work and where it is has been possible to demonstrate that the End Product requirements considered herein have been met for the method of compaction that the contractor proposes to use. Approval of the omission of a compaction trial would be required in writing from the Engineer, however, subject to confirmation of proposed plant and method as described in Cl 13.3.5. This must be sought at least 2 weeks prior the scheduled commencement of the compaction trial. The scheduled commencement of the compaction trial must be in good time in advance of the placement of permanent fill as outlined above.
- 13.3.3 For each material type, a number of test panels will be required in order that a full assessment of the material and compaction method can be completed, which would then constitute the Compaction Trial. Although the size of each panel will reflect the size of the compaction plant and methodology of work proposed, a minimum width of 10m by 20m in length is recommended, with a number of different layer thicknesses trialled as indicated in the Figure below. Any existing topsoil shall be removed from the area of the compaction trial and the formation proof rolled and inspected for soft spots as described in Cls 12.8 and Cl12.9.

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- 13.3.4 The depth of each layer forming the test panel shall reflect the likely range of depths of compacted material to be adopted in the main works, but is not to exceed a compacted layer thickness of 250mm (i.e. an uncompacted layer thickness of not more than 300mm, assuming a 20% reduction in thickness upon compaction, which is to be confirmed by the compaction trial). Each panel shall be made up using the layer thickness being trialled until the total thickness for each trial panel is not less than 1m



- 13.3.5 Each test panel shall be laid out and clearly identified and defined separately from any other test panel to avoid accidental influence from adjacent works. At least 2 weeks prior to undertaking the trial, the Contractor shall confirm to the Engineer the following:

- What compaction plant is to be used, including but not limited to the type of equipment, manufacture, mass per meter width and any other relevant information which can be used to assess its suitability for the material to be compacted.
- What method of compaction is to be used in the trial and whether or not it has been based upon the guidance from SHW Table 6/4.
- Confirmation of the source of material to be used.
- Confirmation that they understand the minimum specification requirements for end-performance of the fill which are to be assessed and demonstrated during the trial.
- The methodology for assessing fill, including test type and frequency and who will be undertaking the testing both on site and for the subsequent laboratory analysis.
- Confirmation that all parties who are to attend the trial have been informed of when and where the trial will be undertaken.

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- 13.3.6 For each proposed compaction method, a number of test panels shall be constructed in order to allow a full assessment to be completed. Key criteria to identify during the compaction trial will be:
- Change in density and air voids against number of passes.
 - Change in density and air voids against thickness of layer.
 - Change in engineering performance against compactive effort.
 - Identification of point of over-compaction/softening of fill.
 - Comparative analysis between different plant.
 - Suitability of material for use on site for the proposed end-use.
 - Confirmation of classification and engineering performance of material, including sampling, laboratory testing and classification of the material.
 - Comparison of actual performance of material against End Product requirements.
 - Calibration of testing equipment, in particular where the use of a Nuclear Density Gauge [NDG] is proposed for the monitoring of earthworks operation.

Compaction of Test Panels

- 13.3.7 Earthmoving plant shall not be accepted as compaction equipment, nor the use of lighter compaction plant to provide any preliminary compaction prior to the use of heavier equipment.
- 13.3.8 Although the guidance from Table 6/4 of the SHW may indicate the optimum number of passes of the appropriate plant, it is important that the progression of improvement of the material is monitored throughout the compaction process. As such, after every two passes of the appropriate roller, in-situ assessment of the density of the material shall be undertaken. One pass of the roller is defined as a single movement of the compaction plant, in one direction, over a given strip of the test panel.
- 13.3.9 Where the width of the test panel or roller requires a number of passes in order to ensure the full width of the surface is compacted, it is acceptable for the roller to overlap the previous strip by a small margin [no more than 25% of the maximum roller width]. However the Contractor shall ensure that no in-situ testing is undertaken in this zone to prevent the effect of over-compaction influencing the assessment of the performance of the plant and material.
- 13.3.10 Compaction of the test panel shall continue incrementally until a clear indication has been obtained to show that the soil has either achieved a maximum density, i.e. where after a number of repeat passes is completed no change is identified or has been over compacted and the performance of the material begins to deteriorate.
- 13.3.11 The exception to this will be where the final performance of the test panel is required to be confirmed using plate load testing, and in this instance it is recommended that a separate panel is constructed, to the same specification as has been identified during the compaction trial, in order that the assessment of the performance can be completed without the detrimental influence of over-compacted material. Guidance on the point of over compaction may be readily identifiable on site from a number of key parameters:

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- Reduction in bulk density/dry density with increasing compaction.
- Increase in moisture content, where the over-compaction of the material drives moisture up through the material to the surface [mobilisation of excess pore pressure]. This may also be observed during the passage of the roller, with material adhering to the roller, and/or the surface of the compacted layer beginning to tear.
- Reduction in engineering performance of the material with increasing compaction.
- Visible movement of the surface of the material during the passage of the compaction plant, typically exhibited as a 'bow wave' in front of the roller.

13.3.12 Identifying the point at which the materials become over-compacted is very important for a number of reasons. Should the material not be competent to undergo additional compaction and/or trafficking, then an engineering decision will be required by the Contractor prior to the commencement of the main earthworks program.

Assessment of Test Panels

13.3.13 The compaction trials shall be undertaken in such a way as to demonstrate what works are able to achieve the End Product criteria given in Appendix 6/1.

13.3.14 Initial characterisation of the material shall comprise: sets of testing (one from each layer) each comprising grading, laboratory compaction curves [OMC/MDD using the test appropriate to the material type as given in Appendix 6/1], particle density, field moisture content and laboratory permeability testing.

13.3.15 In-situ density (bulk and dry) measurement of the compacted material and moisture content shall comprise: on each layer and at each increment of two passes: six nuclear density gauge readings, evenly spaced in two rows at distances of 5m, 10m and 15m along the test layer. Refer to Appendix 1/5 with respect to the use of NDG equipment. Undrained Shear Strength using hand shear vane shall comprise: on each completed panel: one test per density test location. Refer to Appendix 1/5 regarding the use of Hand Shear Vane equipment.

13.3.16 A CBR value using conventional CBR testing apparatus shall be determined on each completed test panel to determine the materials suitability for use in the upper 2 layers of Engineered Fill. Tests shall be evenly spaced in a central row at distances of 5m, 10m and 15m along the test panel.

13.3.17 CBR using Plate Load Tests shall be completed after CBR testing outlined in 13.3.15 has indicated that a value of 3% has been achieved for a given number of passes. 1 Plate Load Test shall be undertaken per trial panel. The test is to be undertaken in the centre of the panel and in multiple cycles as defined in IAN 73/06.12.3.18. Table 6/3-1 summarises the minimum testing requirements to be undertaken for each trial panel.

13.3.18 Upon completion of the above a soakaway test shall be performed in the test panel materials so as to determine the infiltration rate. The base of the associated excavation shall such that not less than 500mm of trialed material is present below the test. Refer to Appendix 1/5 for further details for the test method.

13.3.19 The Contractor shall provide a report describing the findings of the test panel. The proposed report format shall be presented to the Engineer 2 weeks in advance of any test panel tests for approval. The report shall include:

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- Date and weather conditions, personnel recording the test panel findings.
- Description of the plant and method used (make, weight, roller size etc.).
- Description of material used in the test panel (stockpile, tests result certificates, Class type).
- Photographic records of material used, plant used and examples of the as compacted condition.
- Certificates for insitu and laboratory tests undertaken on the compacted layers.
- Appraisal of test results, conclusions and description of proposed method.

Table 6/3-1 Compaction Trial Testing Requirements

Test Property	Recommended Frequency of Testing
Bulk Samples before compaction	Per layer for MC, PSD, OMC/MDD, particle density and laboratory permeability testing.
Bulk, Dry Density and Air Voids	6 tests per compaction increment per layer using NDG ¹ All such tests to include particle density and moisture content determinations hence derivation of air voids. % relative compaction to be determined relative to the MDD established for the layer.
Undrained shear strength ²	1 per NDG test using HSV
NDG Calibration ¹	One calibration of NDG equipment shall be undertaken for each compaction trial and for each instrument used. The calibration shall be undertaken in accordance with methods prescribed in BS1377 Part 9: 2.5
CBR (BS1377 Part 9 Section 4.3)	3 test per panel at the specified locations.
Plate Load Test to IAN 73/06	1 per completed trial panel, multiple cycles as defined in IAN 73/06
Soakaway Test (BRE 365)	1 set of tests per completed trial panel

1. subject to revision depending on soil type – refer to note 12 in Appendix 1/5.

2. Where fill is cohesive

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13.4 Placing and Compacting Fill

- 13.4.1 Cobbles, boulders, rocks or fragments whose largest dimension is greater than two-thirds of the loose layer thickness shall not be incorporated into the Earthworks Material. Any softened cohesive materials encountered in stockpiles shall be removed and not incorporated into the fill. Potentially deleterious materials shall not be incorporated into the fill.
- 13.4.2 The contractor shall take all necessary steps to ensure that fills are placed at the moisture content necessary to achieve the compaction specification and shall, where necessary, add water to or dry the fill, in order to obtain this value. Where it is necessary to add water, this shall be done as a fine spray and in such a way that there is time for the water to be absorbed into the fill before being rolled by the plant.
- 13.4.3 Compaction plant and compaction method shall be selected having regard to the proximity of existing trenches, excavations, retaining walls or other structures and all work shall be performed in such a way as to ensure that their stability is not impaired.
- 13.4.4 If the results of control tests indicate that the fill is being placed and compacted in such a way that the desired End Product is not being achieved, the Contractor shall further compact or, if necessary, shall excavate the affected work and replace with new fill, compacted to meet the specification requirements.

14.0 End Product Testing

- 14.1 The compliance of the compacted materials meeting the compaction specification shall be demonstrated by undertaking End Product testing as detailed in Appendix 1/5 and with reference to End Product requirements given in Table 6/1 of Appendix 6/1. Test locations shall be evenly distributed throughout the fill area at the frequency defined in Appendix 1/5. The Contractor shall agree test locations with the Engineer.
- 14.2 The Engineer shall be at liberty to request additional tests considered necessary to confirm that the End Product requirements are being met.
- 14.3 In the event of a test failure the Contractor shall provide a full comprehensive interpretation of the nature of the failure based on the test results and propose suitable remedial action. In the event of a test failure the Engineer shall be informed verbally immediately and (no later than 48 hours in writing), all work should cease in the associated area until a full comprehensive interpretation and solution has been found to rectify any such failure.
- 14.4 The relative dry density requirement shall be deemed to have been obtained provided that at least 90% MDD of tests attain the specified dry density, provided that no value falls below 93% MDD.
- 14.5 The air voids required shall be deemed to have been achieved if at least 90% of tests attain the specified air voids, provided that no remit value exceeds 10% air voids.
- 14.6 Placed and compacted cohesive soils are to be have an undrained shear strength of 50kN/m² using the testing methods described in Appendix 1/5.
- 14.7 With respect to permeability the end product requirements can be consider to be met provided all of the following requirements are satisfied (i) laboratory permeability tests record permeability values of not more than 1×10^{-7} m/s and (ii) the requirements for relative density

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and air voids given above are met and (iii) the soakaway tests determine an infiltration rate of not more than 10^{-7} m/s.

- 14.8 CBR tests on placed and compacted materials at as placed moisture content in the upper 2 layers of Engineered Fill. CBR tests shall be at a rate of 1 per 35m x 35m grid per layer and are to demonstrate a CBR of 3%.
- 14.9 Plate load tests (min 300mm dia. plate) shall be carried out in accordance with IAN 73/06 on the completed Earthworks Formation Level to demonstrate a minimum CBR value of 3% at the as placed moisture content. Such testing is to be undertaken on a 70x70m grid, subject to modification to ensure that any marginal pass CBR determinations (arising from testing based Appendix 1/5 and Appendix 6/1) are tested.
- 14.10 The requirement for flux chamber tests and a surface emission mapping survey for ground gas assessment purposes is detailed in Appendix 6/12.
- 15.0 Additional Limitations of Deposition of Materials Referred to in 601.13, 601.14 and 601.17**
- 15.1 Cobbles having an equivalent diameter of more than 150mm shall not be deposited within 2m of the finished surface at any location.
- 16.0 Permissible Deviation**
- 16.1 Permissible deviation from formation levels +/- 50mm.
Permissible deviation from linear dimensions +/- 75mm.
- 16.2 In addition the requirements of Appendix 6/13 should be noted. In the event of conflict Appendix 6/13 takes precedence.
- 17.0 Restrictions on Battering of Excavations for Foundations and Trenches and Requirements for Benching**
- 17.1 No specific limitations or restrictions are included for the battering of excavations for foundations and , but the contractor shall be responsible for ensuring safe working practices. Battered excavations are to be benched prior to backfilling. Contractor to also note the specific requirements for batter where existing Made Ground is to receive fill as indicated on SK53
- Benching or shaping of earthworks slope faces to receive fill
- 17.2 Where existing embankments are to be extended and where fill is to be constructed on ground with a slope steeper than one in eight, benching of the existing slope shall be formed as per the Specification. Bench heights are to be a multiple of the relevant compaction layer thickness, with the maximum vertical height of each bench not exceeding 500mm.
- 17.3 Where, during the progress of the work, the difference in level between adjacent areas of filling exceeds 600mm, the Contractor shall cut into the edge of higher filling to form benches having a minimum width of 600mm and a height equivalent to the depth of a layer of compacted filling. The Contractor shall spread and compact new filling to ensure maximum continuity with the previous filling.
- 17.4 Where the Engineered Fill is to be placed against a batter comprising existing Made Ground (which is to be treated by preload/surcharge loading) the tie in will be based on a suitable benching arrangement which is described thus: the material is to be placed and compacted in a

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prepared benched excavation formed in the natural undisturbed clay. The height of the benches shall be as per the layer thickness required by the compaction method used but the height shall not exceed 250mm. The width of each bench shall be the greater (i) 3 x bench height, (ii) 1.0m or (iii) the width required to ensure adequate compaction by the plant used. Refer to 11950-SK53 for detail.

17.5 Fill material in areas of benching shall be carefully placed and compacted to ensure that no voids occur at the upright steps of the benching.

17.6 Placement and compaction of the fill material shall continue to the level of an adjacent bench before material is placed upon that bench.

17.7 Four additional passes of the roller shall be made on the area within two metres each side of the upright face immediately following the compaction of the first layer of fill material on each bench.

18.0 Excavation Supports to be Left in Place

18.1 No excavation supports are to be left in place.

19.0 Mixing of Excavated Materials

19.1 Mixing of acceptable and unacceptable excavated material is not permitted.

20.0 Fill to Excavated Voids.

20.1 Areas of inadequate strength shall be removed and backfilled and replaced with materials placed and compacted in accordance with this Specification.

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21.0 Deterioration of Fill Materials

- 21.1 If an authorised formation or material deposited as fill subsequently deteriorates due to inclement weather or water ingress (or for any other reason) such that, in the opinion of the Engineer, it would be reclassified as unacceptable and cannot be compacted in accordance with the Contract, the Contractor shall:
- i. Cease work on the material until its condition is such that it can again be classified as acceptable.
 - ii. Make good by removing and disposing of the unacceptable material and replacing it with acceptable material.
- 21.2 Where, in the opinion of the Engineer, earthworks have been adversely affected by the ingress of water during the earthworks contract so as to render the material unacceptable, these works shall be removed and made good at the Contractor's expense subject to test results proving the material to be unacceptable

22.0 Reporting for Earthworks Validation

- 22.1 On completion of each site specific earthworks operation, The Contractor will prepare a collated factual Validation Report and submit to the Engineer. It shall also include information needed for completion of the geotechnical feedback report as defined in Design Manual for Roads and Bridges (BMRB) HD22/08 Managing Geotechnical Risk.

The validation report is to include, but is noted limited to, the following:

- a) general description of the earthworks, excavations, placement and compaction methodology and plant used;
- b) quantities of excavated, imported, re-used, treated and disposed materials;
- c) details of remediation and treatment, including quantities, licence arrangements;
- d) the extent of the excavation formation;
- e) details and quantities of any grouting, sealing or similar of historical structures;
- f) surveyed location of all remnant obstructions and week by week progress drawings;
- g) detailed weather conditions;
- h) formation treatment including ground improvement, drainage measures and treatment of soft areas or contamination;
- i) data relating to the relevant compaction trial reports.
- j) application of acceptability criteria and summary of the end product test results for each specific earthworks material placed during the earthworks operations;
- k) a copy of all test results including grid location and level;
- l) actions taken in relation to any test failures and the results of any testing associated with this;
- m) drawings showing the location of each specific earthworks material placed during the earthworks operations on a layer by layer basis, any feature or operation relevant to the earthworks including instrumentation and the location of the trial areas and control tests;
- n) drawings showing the location, extent and contours of all stockpiles formed from surplus site won soils;
- o) an electronic copy of all the test results and monitoring associated with the earthworks operations, including chemical validation results and including those associated with surplus soil stockpiles;
- p) environmental and groundwater monitoring results;
- q) additional requirements of the Local Authority and Environment Agency;
- r) Contamination relevant records including:

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- Description of U1B / U2 material actions
- Description of residual contamination
- Volumes of Materials Treated, Disposed of, Imported and Stockpiled (Soil and Water)
- Description of Waste Management: Quantities, Classification, Licensing and Documentation
- Formation Inspection
- Remnant Obstructions
- QP Declaration for MMP
- All records required for the Phase 2.2 aspect of the MMP validation report
- Details of Regulatory Liaison and Discussions
- Waste Records (including classification and Duty of Care)
- Laboratory analytical results.
- Photographs

22.2 The Contractor shall make provision for the production of three such validation reports to enable phased delivery of the site.

23.0 Other survey Requirements

23.1 Before starting work the Contractor shall complete a visual survey and update the topographical survey of the site and submit the survey report to the Engineer.

23.2 During works the Contractor shall survey the extents of excavation, retained features (such as obstructions) and underground services (if encountered) prior to backfilling.

23.3a The Contractor shall provide a survey of: the Excavation Formation Level; location of former subterranean structures removed; drainage routes; extent and level of each layer of compacted earthworks layer placed (see below); the top level and extent of Engineered Fill; and the extent of surcharge load. All retained exploratory locations and supplementary investigation points shall also be surveyed and included.

23.3b Subject to the prior written agreement of the Engineer and the presentation of an agreed Method Statement, the contractor shall be permitted to omit the survey of each Engineered Fill layer placed on the provision that all the associated earthworks plant is demonstrated to have a working GPS layer control in addition to other earthworks controls on level thickness. The contractor shall still maintain a layer control system such that each layer can be individually identified and sample locations still surveyed (along with other survey requirements noted above/elsewhere). If in the opinion of the Engineer layer control is not being achieved the Contractor shall be required to implement the survey of each layer.

23.4 On completion of the bulk earthworks and the surcharge loading treatment (as discussed in App 6/13 and including any making good of levels and re-making up to final site level), an as built survey, including level data of the completed works shall be undertaken by the Contractor. All level survey information and an assessment of volumes of excavated, remediated and surplus soil shall be provided to the Engineer. The final 'as built' topographic survey shall include details of the earthworks placement areas, reduced level areas and remaining stockpiles.

23.5 Survey works shall ensure that the reporting requirements given above can be met along with any other survey requirements given in this specification.

23.6 All levels shall be related to Ordnance Datum Newlyn and surveys shall be based on the national grid coordinate system and shall be considered with the updated topographical survey.

23.7 The maximum error between permanent survey control stations shall not exceed 1:20,000.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

- 23.8 A drawing shall indicate each permanent survey control station showing its general location with dimensions to at least three easily recognisable and durable points.
- 23.9 The maximum distance between adjacent spot levels shall not exceed 15 metres. Ground survey spot levels on hard surfaces shall be correct to +/- 10mm r.m.s.e. and elsewhere to +/- 25mm r.m.s.e. Accuracy for linear dimensions is to be +/- 25mm. The drawing shall be supplied in 3D AUTOCAD.DWG format, at a scale of 1:200 on CD ROM. It shall be kept up to date on at least a weekly basis with respect to ground excavations and be made available to the Engineer on request.
- 24.0 Tie in Of Engineered Fill with Surrounding Ground (where required)**
- 24.1 As part of the excavation works for Phase 2.3, using as built plans for the Phase 2.1 area (as provided by Dunton Environmental Limited) the clay cap shall be located by the contractor. The placement and compaction of Engineered Fill as of the Phase 2.3 works shall be undertaken by the contractor so as to tie into this existing clay cap in accordance with Drawing CE 328. The same approach will be taken on long the Phase 2.2 boundary if the Phase 2.2 works precede the Phase 2.3 works.
- 24.24 Fill material in areas of benching shall be carefully placed and compacted to ensure that no voids occur at the upright steps of the benching.
- 24.5 Placement and compaction of the fill material shall continue to the level of the adjacent bench before material is placed upon that bench.
- 24.46 Four additional passes of the roller shall be made on the area within two metres each side of the upright face immediately following the compaction of the first layer of fill material on each bench.

APPENDIX 6/8: TOPSOIL

APPENDIX 6/8: TOPSOIL

APPENDIX 6/8: TOPSOIL

Strip topsoil and stockpile. Stockpiles of topsoil and pseudo-topsoil shall be formed in accordance with guidance provided by DEFRA '*Construction code of Practice for the Sustainable Use of Soils on Construction Sites (2009)*'.

APPENDIX 6/12: INSTRUMENTATION AND MONTORING

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

Refer to Appendix 6/13 for instrumentation and monitoring associated with the ground treatment works.

Refer to the CEMP for environmental monitoring requirements

1.0 Post Earthworks Gas Monitoring

1.1 In order to inform the requirement for gas protection measures in the proposed development gas monitoring will be required.

1.2 Installations will be carried out via Dynamic Continuous Sampler (DCS) at the locations indicated on drawing GIS103C. Two holes will be required at those locations where different depths and/or strata require monitoring (as detailed below). The response zones shall be isolated into one material only and single locations with dual installations shall not be carried out. The following criteria shall be followed:

a) Locations in the Surcharge Area - two installations required. The shallow well shall be progressed through the surcharge, where present, and extend 1m into the underlying Engineered Fill with a 0.5m response zone at the base. The holes shall be sealed with bentonite above the response zone to the surface. The deeper well shall be sealed with bentonite all the way through the clay cap and the response zone shall be 3m long in the underlying fill material (not to extend into the Weald Clay, if encountered).

b) Locations outside the Surcharge Area and over Engineered Fill which is deeper than 2.5m - two installations required at those locations where Engineered Fill exceeds 2.5m depth. The shallow well shall be 1m deep overall with a 0.5m response zone at the base. The deeper wells, where installed, shall be sealed with bentonite to 2m below ground level. The response zone will extend to the base of the Engineered Fill or be 3m in length, whichever is the shallower.

c) Locations outside the Surcharge Area and over Engineered Fill which is less than 2.5m depth, or over natural clay (i.e. no fill materials present) - the well shall be 1m deep overall with a 0.5m response zone at the base.

1.3 The works shall be progressively carried out as phases are completed across the site.

1.4 The works shall be carried out in accordance with BS 8576: 2013 and the UK Specification for Ground Investigation, 2nd Edition, published by Thomas Telford Ltd 2012 with the following amendment to Clause 12.4.1:

1. The following parameters shall be monitored and recorded on each visit to the site. Items iv to viii shall proceed in the order stated and the gas tap shall be closed between the flow and gas concentration stages.

i) Weather conditions on the day of and 24 hours prior to the visit.

ii) Air temperature.

iii) Barometric Pressure on day of visit and preceding 3 days.

iv) Downhole temperature.

v) Downhole pressure and the flow rate should be recorded every minute over a 10 minute period.

vi) Concentrations (% vol) of CH₄, CO₂ and O₂ (ppm) over a 10 minute period with concentrations recorded every minute.

vii) Water level

If water is encountered the Engineer may instruct removal.

Engineer approval shall be obtained prior to commencement of any laboratory analysis.

APPENDIX 6/12: INSTRUMENTATION AND MONTORING

The Engineer may instruct that prolonged pumping gas monitoring is undertaken over a period of up to 2 hours on selected wells.

2. Monitoring on-site shall generally be undertaken using portable handheld equipment. The performance specification and accuracy of the equipment employed shall meet the requirements of Table 2 in BS8576: 2013 and be stated in the final report.

3. Any damage to the monitoring installation or incidents of open gas taps upon arrival shall be recorded.

4. The name of the person monitoring shall be stated and wherever possible the same person shall be used on each monitoring visit to maximise consistency. Monitoring visits shall be coordinated so as to include 'worst case' events comprising periods of rapidly falling barometric pressure.

- 1.5 Before construction of each ground gas standpipe the Engineer shall be contacted to agree installation details.
- 1.6 Bulk bag soil samples shall be taken in order to accommodate Forensic TOC analysis that may be scheduled. For the shallow installations one representative samples shall be taken of the Engineered Fill (all sampled soils will be placed into a large bulk bag throughout the full depth of the fill); and for the deeper installations one representative samples shall be taken of the unclassified fill (all sampled soils will be placed into a large bulk bag throughout the full depth of the fill).
- 1.7 The temperature of the soil shall be recorded every 1m on removal of the borehole tool.
- 1.8 Soil descriptions and logs are required in accordance with BS 5930:2015.
- 1.9 Raised covers will be provided and these will be protected via concrete drainage rings or similar (e.g. 0.5m depth, 2m diameter)
- 1.10 Monitoring for flammable gases via Flame Ionisation Detector (FID) is required at 1m intervals during formation of each borehole. Results to be provided on the respective logs.
- 1.11 Provision shall be made for 3 months monitoring at *weekly intervals* on the surcharged areas of the site. Monitoring may be curtailed in areas where initial monitoring results are within acceptable parameters but this will require agreement with the Regulator. Three monitoring visits should be required in total in the single installation DCS 1102 in the non surcharge area which has been subject to a cut and fill treatment.
- 1.12 Groundwater samples shall be obtained for each installation on the first 2 sequential visits and the samples tested for pH, conductivity, ammonia, dissolved oxygen, dissolved carbon dioxide and SO₄. Samples shall be obtained using low flow sampling methods.
- 1.13 Data shall be provided in excel, pdf and AGS 3.1 in full incorporating both the main phase of fieldwork and all subsequent gas and water monitoring visits and iterative phases of chemical analysis. The data shall be checked by the Contractor prior to issue and be accompanied by the error log.
- 1.14 In order to prevent the creation of gas migration pathways and to prevent water ingress all installations will be decommissioned upon completion of the monitoring (as agreed with the regulatory authorities) in accordance with EA guidance (Decommissioning Redundant Boreholes and Wells).

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

2.0 Large Scale Gas Generation Field Tests (Drum Tests)

2.1 Drum Tests shall be undertaken as per the frequency provided in Appendix 1/5 on the following classes of soils: 1A – 1C and 2A – 2D.

2.2 Scope

2.2.1 This document specifies test methods for assessing the gas generation potential of fill materials used below developments.

2.2.2 This is intended as a test from which the risk associated with ground gas generation from fill materials below developments can be assessed following guidance in documents such as the Local Authority Guide to Ground Gas (CIEH, 2007).

2.2.3 This test provides a measure of the potential amount of biogas (methane and carbon dioxide) that might be released if it is placed in the ground. It is a large scale test that is intended to replicate the actual ground conditions in a site. As such it is not artificially seeded with an inoculum of methanogenic bacteria and any gas generated is the result of bacteria present in the fill already.

2.3 Terms and definitions

2.3.1 For the purposes of this document the following terms and definitions apply.

Biogas – methane and carbon dioxide.

Aerobic – Soil atmosphere that is rich in oxygen.

Anaerobic – Soil atmosphere that does not contain oxygen.

Biodegradation - chemical dissolution of materials by bacteria, fungi or other biological means.

2.4 Principle

2.4.1 When fill material is placed in the ground it will initially be in an aerobic environment as oxygen is trapped in the material. Aerobic degradation of any degradable organic matter occurs and uses up the oxygen. Once anaerobic conditions are established methanogenic bacteria continue to degrade the organic material that is available for degradation until it is used up and gas production ceases.

2.4.2 A representative sample of fill material and groundwater from a site is placed in a sealed steel drum. A sealable gas tap is fitted to the top of the drum to allow gas monitoring from the headspace above the sample. The concentration of methane and carbon dioxide in the headspace of the drum is recorded at set intervals over a period from 20 days to 100+ days.

The temperature during the test is recorded (but is not maintained at a set value). The ambient temperature during the tests must not drop below 10°C (in winter the tests will need to be housed indoors and appropriate safety precautions taken).

2.4.3 The results are reported as litres of biogas per kg of fill material.

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2.5 **Equipment**

Biodegradation test vessels – a series of steel drums of height 0.85m and diameter 0.57m. This gives 0.22m³ internal volume with an air tight lid and a sealable gas tap. (other dimensions to be agreed with the Engineer)

Balance – capable of weighing mass of sample to +/- 1%

Thermometer – capable of measuring air temperature to +/- 0.5°C

Gas monitor – Meeting the requirements of BS8576: 2013, Guidance on investigations for ground gas – permanent gases and volatile organic compounds (VOCs). Clause 9.3 and Table 2. The sample pump rate should be stated.

2.6 **Sample Size**

2.6.1 The sample should be sufficient to fill a 0.22m³ drum and leave a 100mm deep headspace at the top of the drum when loosely compacted down in the drum. The weight of the sample should be recorded.

2.7 **Procedure****Filling**

2.7.1 A steel drum is filled with the material to be tested.

2.7.2 The materials shall be loosely compacted into the steel drum to remove all large voids and leaving a 0.1m depth of headspace (this equates to 0.025 m³ headspace volume). The mass of each material used to fill the barrels should be measured using a balance to determine the approximate wet bulk density of the material within each barrel. The moisture content of the materials placed into the barrels will be measured using either a theta probe or by sending samples to a laboratory.

2.7.3 Groundwater from the site should be used to fill the barrels with at least 20 litres of water (to the top of the soil).

2.7.4 Following emplacement of the materials into the barrels and filling with water, the barrel lids should be secured and sealed using a volatile organic compound (VOC) free sealant. A small hole (0.5mm diameter) should be drilled into the top of the barrel lid for insertion of a gas tap. The gas tap should be sealed into the barrel lid using a VOC free sealant. Filling of the drum and sealing and securing of the gas tap should be carried out on the same day.

2.7.5 Filled barrels should be located in a safe location agreed with site staff where there is no need for disturbance of the barrels during the test period. The ambient temperature during the tests should not fall below 10°C for any significant period of time and therefore a heated container shall be provided, if required, to ensure temperature does not fall below 10°C.

Biogas measurement

2.7.6 Following filling of the barrels on day zero, measurements of ground gas concentrations should be made twice per week at three day intervals (e.g. Monday and Thursday) over a period of 100 days. Each measurement event shall last for exactly 5 minutes (if this is amended then the time shall be recorded but amendments must be avoided where at all possible). Concentrations of ground gases will be recorded each minute over the 5 minute period. The tests may be extended up to a total period beyond 100 days if required. The date of the first test should be recorded as T1 and dated, the second as T2 and dated, and so on.

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- 2.7.7 Concentrations of ground gases will be measured using the gas monitor. Gases measured should be methane (CH₄), carbon dioxide (CO₂), oxygen (O₂), carbon monoxide (CO) and hydrogen sulphide (H₂S). Flow measurements are not required but the differential (may be referred to as borehole pressure on some gas monitors) is required. The temperature of the barrels should be recorded during each measurement event.
- 2.7.8 To measure the temperature of the soils within the drum one thermometer/thermocouple should be attached to the side of each of the drums and protected as necessary. The bulb/thermocouple wire leg junction should be thermally protected from the elements using insulation spray foam or similar.

Reporting for Drum Tests and Gas Monitoring

- 2.7.9 The test report should provide the following:
1. Date of test
 2. Description of material tested and source
 3. Cumulative record of biogas concentration and number of sampling events.
 4. Temperature record over period of test
- 2.7.10 The test results shall be provided in an excel spreadsheet that is updated each time measurements are taken. The results should be provided in tabular form in the spreadsheet in a layout that is agreed with the Engineer.
- 2.7.11 The results of each weekly monitoring round will be forwarded to the Engineer on completion.
- 2.7.12 The Drum Test is for information and assessment purposes and the results will be used to inform remedial and re-use decisions.

3.0 Flux Chamber Tests

Flux chamber tests shall be undertaken at 12 locations to measure methane emissions, as shown on Figure GIS103C. For the Surcharged Area the tests will be carried out over the surface of the excavated formation layer, including over dig, and prior to installation of Engineered Fill. If the results indicate a potential gas risk then the monitoring shall be repeated on completion of the installation of the engineered fill and prior to the installation of the surcharge. For non surcharged areas they shall be carried out across the finished formation layer. The flux chamber tests shall be undertaken in accordance with the guidance in the Environment Agency LFGTN 07, Guidance on monitoring landfill gas surface emissions. The location of the tests shall be agreed with the Engineer in advance. A method statement for the works shall be agreed with the Engineer for prior approval. If the Contractor is not able to carry out the works then the work shall be sub contracted, at no additional cost to the client, to a suitable specialist who must be approved by the Engineer prior to appointment.

4.0 Surface Emission Tests

- 4.1 A surface emission mapping survey shall be carried out to measure methane emissions.
- 4.2 For the Surcharged Area the survey shall be carried out over a 5m grid (i.e. on a series of traverse lines spaced at 5.0m centres). The survey will be carried out over the surface of the excavated formation layer, including over dig, and prior to installation of Engineered Fill. If the results indicate a potential gas risk then the monitoring shall be repeated on completion of the installation of the engineered fill and prior to the installation of the surcharge.

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- 4.3 For non surcharged areas the survey shall be conducted on a 25m grid across the finished formation layer
- 4.4 All measurements shall be taken at 10mm above ground level with a laser diode methane detector calibrated to detect methane and with a detection threshold of 1 ppm. The instrument shall have a response time less than 5 seconds. Readings shall be taken every 3 seconds and shall be time stamped with the time and GPS location.
- 4.5 The survey work shall be carried out by an experienced and competent technician who has undertaken similar work for compliance testing on licensed landfill sites. A method statement for the works will be submitted to the Engineer for prior approval. If the Contractor is not able to carry out the works then the work shall be sub contracted to a suitable specialist who must be approved by The Engineer prior to appointment. The results shall be reported as a table of results alongside a contour plot of the emissions recorded. The wind speed/direction, temperature, atmospheric pressure and rainfall on the site at the time of the survey shall be recorded.

5.0 Validation Trial Pits in Surcharged Area

- 5.1 Following formation level excavations and prior to construction of the Engineered Fill, trial pits shall be excavated to 4m below excavation formation level across landfilled areas on an approximate 50m grid. The locations are shown on drawing GIS103C. The purpose of these is to inspect for both gaseous material and soft / organic material that could present an ground settlement issue. The Contractor shall provide advance notification for the Engineer for the completion of pits such that supervision can be provided.

Gas Related Pits

- 5.2 Composite samples of representative soils from the excavated soils shall be taken for one Forensic TOC and one Drum Test per trial pit. In addition, trial pits shall be excavated in the vicinity of those areas where elevated forensic TOC concentrations and /or elevated methane concentrations were detected: BH822, BH833, BH842C and TP867, as shown on drawing GIS103C. A total of 19 trial pits are required for this purpose.
- 5.3 If Forensic TOC analysis and/or assessments associated with the Drum Tests indicate Unacceptable Material then these may require excavation as part of a hot spot exercise and the soil will be stockpiled for further assessment. The Contractor shall therefore allow time in the programme for results to be returned and assessed to accommodate this potential outcome. All trial pit locations will be labelled in number order (DuntonTrialPit1100 series – DTP1101 etc.) and surveyed in accordance with this specification (one survey point per trial pit location is sufficient). The trial pits will require inspection by the Engineer and therefore the Contractor will provide 5 days' notice of the works.

Geotechnical Trial Pits

- 5.4 Nine trial pits shall be excavated to 4m below excavation formation level in areas where the ground investigation identified potentially highly compressible material beneath the excavation formation level (BH822, BH833 and TP837). The locations are shown on drawing GIS103C and are denoted by GTP110 series (geotechnical trial pit). The pits are to be surveyed in accordance with this specification (one survey point per trial pit location is sufficient). The trial pits will require inspection by the Engineer and therefore the Contractor will provide 5 days' notice of the works.
- 5.5 The pits are required to determine whether the zones represent significant soft spots that require excavation and replacement with Engineered Fill. The location of these is to be advised.

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- 5.6 Subject to the Engineers instruction the Contractor shall excavate any soft or highly degradable materials and replace with Engineered Fill

APPENDIX 6/13: GROUND IMPROVEMENT

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1.0 Geotechnical Improvement by Placement of Engineered Fill and Preloading by Surcharge**1.1 General**

- 1.1.1 Geotechnical improvement will not be required where the excavation formation reveals the presence of undisturbed natural strata comprising firm clay or medium dense sand or better. Geotechnical improvement will be required in areas where Made Ground is encountered at excavation formation level. The purpose of the ground treatment is to ensure that the resultant works meet with the 'Performance Criteria' agreed with the Client (the performance criteria agreed with the client comprise total post construction settlements of not more than 75mm a differential movement of not more than 1/100, a permeability of not more than 10^{-7} m/s and a CBR value of 3% as the final and penultimate placed layers.
- 1.1.2 To ensure that the post treatment load-settlement characteristics of the treated materials are within the performance criteria mentioned above, geotechnical improvement is to be undertaken by forming: (i) pre-loading and surcharge loading of the pre-existing Made Ground; (2) the placement and compaction of fill materials to End Product criteria, as outlined below, totalling a 2m minimum thickness.
- 1.1.3 This fill is to be placed and compacted so as to form an Engineered Fill. The Engineered Fill is to have the following properties: (i) a permeability of less than 10^{-7} m/sec (ii) an air voids content of not more than 5% (increasing to not more than 10% where below 2m below proposed site level); (iii) relative density of not less than 95% Maximum Dry Density based on the appropriate compaction test for the material type (see Appendix 6/1); and (iv) a CBR value of not less than 3% at as placed moisture content in the upper 2 layers.
- 1.1.4 The earthworks operations undertaken to form the Engineered Fill outlined above shall be informed by compaction trials as detailed in Appendix 6/3. The compaction trials shall be witnessed by the Engineer. On the same basis the Engineer will also witness the construction of installations and monitoring devices associated with the geotechnical improvement works.
- 1.1.5 The works shall be undertaken in the sequence stated in Appendix 6/3.
- 1.1.6 All earthworks and associated compliance testing shall be carried out in accordance with Appendix 6/3. The placement and compaction of the Engineered Fill will be monitored full time by the Engineer.
- 1.1.7 If unforeseen ground conditions or unforeseen responses to the treatment are encountered then the Engineer shall be notified immediately.
- 1.1.8 In the event of a test failure the Contractor shall provide a full comprehensive interpretation of the nature of the failure based on the test results and propose suitable remedial action. In the event of a test failure the Engineer shall be verbally informed immediately (and no later than 48 hours in writing), all work should cease in the associated area until a full comprehensive interpretation and solution has been found to rectify any such failure.

APPENDIX 6/13: GROUND IMPROVEMENT

1.2 Formation of Engineered Fill

1.2.1 The formation of the fills is detailed in Appendix 6/3.

1.3 Surcharge Construction

1.3.1 The lower 250mm of surcharge material shall be constructed from compacted Engineered Fill placed and compacted in accordance with the Appendix 6/3. Upon placement and compaction this upper surface of this 250mm Engineered Fill shall be surveyed. Other materials are then to be placed as discussed below.

1.3.2 The surcharge fills are to be placed to levels and over areas indicated on the Drawings and Sections provided by the Engineer.

1.3.3 No surcharge materials shall be placed closer than 10m to any existing structures, services or road pavements that are to be retained or that are off site.

1.3.4 Above the basal 250mm Engineer fill outlined above, the surcharge material is to comprise either Class 1 or Class 2 materials, as defined in the Specification for Highway Works (SHW) or, subject to the approval of the Engineer, (iii) Class 5 material as defined in the SHW. A minimum of 2 weeks shall be allowed for the Engineer to approve Class 5 material after the Contractor has presented supporting information. The surcharge materials shall be placed and compacted in layers not more than 500mm thick and, to confirm the bulk density of such surcharge materials, insitu density tests are to be undertaken at a frequency of 2 per 2000m³ for each 1m of lift, the test depth for these shall be 300mm below the then current surface of the works. Compaction shall be undertaken using the same plant and number of passes as used for compaction of each material type used in forming the Engineered Fill (i.e. same compactive effort as used for each layer of the Engineered Fill but layer thickness will be greater for the surcharge fill). Alternatively, the surcharge can be constructed from Engineered Fill as detailed in Appendix 6/3. In either case, the information is to be provided to the Engineer who may instruct alterations to the surcharge height so as to ensure an adequate surcharge pressure.

1.3.5 The edges of the surcharge are to be formed at slopes of 1 in 3 unless otherwise agreed by the Engineer.

1.3.6 The contractor is responsible for controlling the rate of construction so as to prevent temporary slope failure due to the increase in pore pressure arising from the earthworks. The contractor is to use the piezometers proposed on drawing CE236 and is to install any additional piezometers as he may require so as to ensure adequate control of the works. Considering his governing criteria for the control the works vs. piezometric level along with associated calculations. The contractor shall employ a suitably qualified temporary works designer to provide this based on established soil mechanics theory and to be referenced accordingly.

1.3.7 The surcharge shall be trimmed to falls to shed rain water and the surface sealed to limit infiltration. The Contractor shall provide temporary drainage at the base of the surcharge to collect run off and to carry any surface water away from the base of the surcharge.

1.3.8 The full extent of the surcharge and its side slopes shall be surveyed upon completion.

1.3.9 Each surcharge treatment zone is to be left insitu for a minimum of 24 weeks after completion of construction to enable the amount and rate of settlement to be monitored and hence establish that 90% of primary consolidation has been achieved and any residual settlement is

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approximately linear when plotted against log time. The duration can be altered by the Engineer depending on the findings of the monitoring data.

- 1.3.10 If 90% consolidation and/or linear settlement vs. log time has not been established at the end of 24 weeks, the Engineer will instruct: (i) additional time for surcharging; (ii) increased surcharge loading; or (iii) acceptance of the anticipated further settlement. Conversely if this is achieved sooner this period may be shortened and it should be recognised therefore the early provision of specified data could provide the option to accelerate the surcharge programme.
- 1.3.11 If the surcharge is constructed as a number discrete panels there is to be a 5m overlap of each individual panel constructed i.e. surcharge panels shall be constructed such that the embankment (at its full height) extends 5m beyond the edge/end of the shoulder of any previous placed surcharge embank. The shoulder of the surcharge is to extend 5m beyond the interface with the undisturbed Weald Clay and 10m in to the adjacent development phase to the north.
- 1.3.12 Following completion of treatment work, panel load tests may be required by the Engineer. Test panels will comprise earth mounds 13m x 13m x 2m high with additional side slopes constructed at 1:3. A settlement plate will be installed centrally beneath the base of the panel to the Engineer's requirements.

1.4 Permanent Datum

- 1.4.1 Two permanent datum's are required to provide a reference for the measurement of ground levels and instrumentation and to provide crosschecks with one another. The datum's are to be fixed into deeper, competent ground and isolated from any soft or compressible strata or strata subject to shrink-swell movements. These datum's are to be as per Fig 6 of BRE Digest 386 'Monitoring Building and Ground Movement by Precise Levelling', are to be at least 25m from existing or recently removed trees and to be secured at a minimum depth of 6m. The datum's shall be fenced off with a fence comprising at least three wooden stakes, 75mm square, preserved in accordance with BS8417, firmly bedded in the ground and stoutly cross-braced and projecting at least 1m above ground level. The woodwork is to be brightly painted.
- 1.4.2 The Contractor shall agree the locations of the permanent datum's with the Engineer 2 weeks ahead of their installation. They are to be located so as to minimise risk of damage from the proposed works, with due regard to any constraints as advised by the client and in areas where the contractor can be sure of security throughout the duration of the monitoring period. The installation of permanent datum's shall be completed prior to the installation of instruments and the commencement of earthworks. It may be permissible to utilise the Phase 2.1 datum's subject to discussion with the Engineer, in which case agreement must be sought two weeks prior to commencement of earthworks or the installation of instruments, whichever is the earliest.
- 1.4.3 The level of the permanent datum's shall be established by the levelling techniques with reference to agreed benchmarks or survey stations in the vicinity. Levelling shall be closed back to the benchmarks to check accuracy.
- 1.4.4 The level value and co-ordinate position shall be measured three times soon after installation of the datum's and shall be checked at intervals to be established by the Engineer.
- 1.4.5 The following data shall be recorded for the permanent datum's:
- § Reduced level of datum (m OD)
 - § Plan position (National Grid Co-ordinates)

APPENDIX 6/13: GROUND IMPROVEMENT

1.5 **Treatment Monitoring**

- 1.5.1 Installation of instruments will be required prior to and after surcharge construction in order to monitor key parameters during the placement of the fill and the subsequent monitoring period. Rod settlement gauges shall be constructed at an approximate grid spacing of 40m, with three additional locations along the proposed primary/strategic road/drainage routes. The RSGs and piezometers are to be installed at positions and levels indicated on drawing 11950/C326.
- 1.5.2 The Contractor shall be responsible for following the manufacturers' instructions and the requirements of this specification in the installation, calibration and testing of all measuring instruments and equipment, which shall be carried out in the presence of the Engineer.
- 1.5.3 The Contractor shall inform the Engineer at least 10 working days prior to undertaking the installation of the equipment. The Contractor shall make due allowances in his construction programme for delays which may arise on account of the installation of the instruments and of their maintenance.
- 1.5.4 The Contractor shall provide a geotechnical engineer or engineering geologist, as approved by the Engineer, experienced in the installation of geotechnical instrumentation for full time supervision of the drilling of boreholes and installation of the instrumentation equipment. The Contractor shall instruct a member of his engineering staff in the use of the equipment.
- 1.5.5 Boreholes for instruments are to be formed by an AGS accredited ground investigation subcontractor in accordance with the UK Specification for Ground Investigation (Second Edition). They may be drilled by any method provided that it results in a clean and stable hole of the required diameter to the correct depth. Boreholes shall be cased to their full depth unless strata are sufficiently competent for the hole to stay open. Drilling mud or polymer additives shall only be used with the prior approval of the Engineer. The Engineer is to be given 2 weeks notice if mud or polymers are proposed. In the case of piezometer installation, drilling mud or polymer additives shall not be permitted.
- 1.5.6 During drilling, care shall be taken to ensure that the minimum material is lost from outside the casing. Surging casing shall not be allowed and flushing of drilling water up the outside of the casing shall be minimised.
- 1.5.7 The method of borehole formation, including the procedure for advancing casing, shall be submitted to the Engineer for approval 2 weeks before the commencement of the works. The works shall not commence until such time as the Engineer has approved the proposals.
- 1.5.8 A small disturbed sample and a bulk disturbed sample shall be taken during drilling of the boreholes at 1.0m centres and at every change in stratum. SPTs are to be performed at 1m intervals. If an SPT test is undertaken at the base of a borehole, it shall be ensured that the borehole extends at least 200mm beyond the base of the SPT test and cleaned out. A geotechnical log shall be produced in accordance with BS5930:2015 from the samples and borehole records submitted to the Engineer one working day after drilling has been completed at that location.
- 1.5.9 For all instruments placed in boreholes, grouting is required for part or all of the borehole during installation. The grout shall be a bentonite: cement mixture with sufficient water to achieve a pumpable mix. For piezometers it shall be ensured that grout placement does not affect the response zone.
- 1.5.10 Grout shall be poured or pumped into boreholes using a tremie pipe.

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- 1.5.11 All instruments shall be labelled with their reference number at the location where readings or measurements are to be taken. The labelling shall be permanent using a method or material to be agreed with the Engineer.
- 1.5.12 The Contractor shall provide suitably qualified and competent staff to take readings of instruments during construction and provide measurements/data at the time the instruments are read. The Contractor shall submit names and evidence of competence of personnel to carry out the instrumentation installation and commissioning for the approval of the Engineer before the commencement of the Works.
- 1.5.13 All records produced for the instrumentation must include the following data:
- § Project name
 - § Contract name and number
 - § Instrument reference number and type
 - § Dates of installation, reading or summary
 - § Times of installation or reading
 - § Chainage and offset (or co-ordinates if appropriate)
 - § Personnel responsible for undertaking the monitoring
 - § Any relevant comments or remarks
- 1.5.14 The Contractor shall prepare an installation record sheet for each instrument installed. The format of the sheet shall be prepared by the Contractor and submitted to the Engineer for approval at least one week before installation commences. The record sheet shall include the following information in addition to the general information required:
- § Existing ground level at the time of installation
 - § Location in plan and elevation – Planned and ‘As Built’
 - § Orientation – Planned and ‘As Built’
 - § Lengths, widths, diameters, depth and volumes of backfill – Planned and ‘As Built’
 - § Equipment used, including diameter and depth of any drill casing used
 - § Spaces for necessary measurements or readings required during installation to ensure that all previous steps have been followed correctly, including acceptance tests
 - § A simplified log of ground conditions (obtained during each boring)
 - § Type of backfill used
 - § Weather conditions
 - Space for notes, including problems encountered, delays, unusual features of the installation and any events that may have a bearing on instrument behaviour
 - § record of commissioning information and readings
 - § Any colour coding used
- 1.5.15 The Contractor shall submit to the Engineer a copy of each installation report sheet within one working day of completion of the installation, including taking of base readings.
- 1.5.16 The Contractor shall maintain the instrumentation in working order throughout the Contract or until the Engineer informs him that monitoring is no longer required. The Contractor shall ensure that the frequency of monitoring is adequate and in compliance with all requirements for control of construction and associated monitoring of constructions, as detailed on the Drawings.

Settlement Gauges

- 1.5.17 Steel plate settlement gauges (300mm square) shall be placed at excavation formation level. Monitoring of these and analysis of the data obtained should enable determination as to when the rate of settlement has suitably reduced and therefore when the surcharge can be removed.

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- 1.5.18 The plates shall have a welded $\frac{3}{4}$ " BSPF socket and are to be connected to reference rods which will extend through the surcharge materials. The steel rods are to be in 1m lengths and to have a 25mm OD with a $\frac{3}{4}$ " BSPF thread and external socket. The settlement gauge base plate and first length of rod shall be placed as early as possible during the earthworks, i.e. before any filling has taken place. Extension lengths shall be installed when the level of the surrounding materials has been brought up to 250mm below the top of the preceding length. Levels shall be taken of the top of the rod and the surcharge fill adjacent to the gauge (i.e. outside the manhole ring) on each occasion. When rods are extended, levels (including the level of the base plate upon addition of the 1st rod) shall be measured immediately before and immediately after adding the extension. Good levelling practice should be observed.
- 1.5.19 Protective tubes will be placed around the reference rods as the surcharge are placed. These are to have an internal diameter of 52mm. In addition manhole rings shall be placed around the settlement gauges and associated rods, which are to be brought up progressively with the formation of the surcharge. Between the manhole ring and the protective tube, Class 6L (sand) shall be evenly placed. This is also to be brought up at the same rate as the construction of the surcharge. Care will be taken so as to prevent the sand from entering the protective tube.
- 1.5.20 Any fill placed around a settlement gauge should be placed in a 5m x 5m area using small manoeuvrable suitably sized compaction plant to avoid the risk of disturbance to the monitoring rod. The fill should be placed in layers of a thickness appropriate to the materials and compaction plant used. A method statement shall be provided by the contractor for approval by Engineer 2 weeks prior to the works.
- 1.5.21 The following data shall be recorded for the settlement gauges and similar settlement monitoring equipment:
- § Original ground level at the gauge location (m OD)
 - § Reduced level of the top of the rod (m OD) and length of rod from this level to base plate (m)
 - § The reduced level of the base plate (mOD)
 - § Reduced level of the ground adjacent to the gauge (m OD)
 - § A record of the height of fill placed and the start/finish dates of filling
 - § The total thickness of the fill (m)
 - § A record of extensions to the gauge, including before/after reduced levels of the gauge
 - § The settlement of the plate relative to base readings and previous readings (m)

Piezometers

- 1.5.22 Prior to placing Engineered Fill vibrating wire piezometers (VWP) shall be installed at the base of the excavation. Piezometers will be installed in the underlying pre-existing Made Ground materials at the following approximate levels.

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Table 1: Proposed Piezometers Levels

Piezometer	Approximate depth below excavation formation level (m)
P1	7
P2	10
P3	3
P4	4
P5	5
P6	6
P7	8
P8	9

Refer to drawing 11950/CE326 for approximate piezometer locations.

Refer to drawing 11950/CE324 for Excavation Formation Levels

- 1.5.23 The piezometers shall be of the VWP-3000 type and are to be installed by an AGS accredited ground investigation subcontractor in accordance with the UK Specification for Ground Investigation (2nd Edition). The equipment shall be installed strictly in accordance with the manufacturer's instructions.
- 1.5.24 Prior to installation of piezometers, the piezometer tips shall be thoroughly saturated by boiling them in previously de-aired water. The piezometer shall be assembled and connected to the tubing while still underwater and the entire arrangement kept saturated and filled with de-aired water for at least 24 hours and until it is installed.
- 1.5.25 The following data shall be provided from the VWP readings:
- § Water pressure reading (m water)
 - § File name of data stored on the data logger
 - § Reduced level of piezometer tip as installed (m OD)
 - § Reduced level of ground adjacent to piezometer (m OD)
 - § Estimated or measured settlement of piezometer tip (m)
 - § Water head (m OD)
 - § Water level (m OD)
 - § Change in water head relative to base reading (m)
- 1.5.26 Initial readings shall be taken to demonstrate when conditions have stabilised following installation. Further readings shall be taken as given in Table 2. Monitoring and analysis of this data should enable the rate of land raising to be controlled by preventing a build-up of destabilising excess porewater pressures (which could otherwise result in an increased risk of shear failure) and will aid in identifying when the rate of settlement has been suitably reduced. The piezometers shall be remotely monitored using data loggers and associated equipment (Contractor to submit proposals 2 weeks ahead of installation).
- 1.5.27 Available ground investigation data suggests that the groundwater level at these locations can vary considerably with location and with time. This may limit the usefulness of the piezometer data. This matter is to be kept under review by the Engineer.

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General Monitoring Requirements

- 1.5.28 All level monitoring and surveying should be accurate to within ± 1 mm in the vertical plane and ± 2.5 mm in the horizontal plane.
- 1.5.29 Monitoring of settlement gauges and piezometers is to commence at least 5 days before earthworks materials are placed. The frequency of monitoring observations is given in Table 2 below. In all cases the frequency of readings may be altered at any time by the Engineer if circumstances so dictate.

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Table 2: Instrument Reading Frequency Summary

Instrument	Initial Reading(s)	Commence Sequential Readings	Initial Sequential Frequency ¹	Subsequent Frequency ¹	Surcharge Removal ^{1,2}
Settlement Gauges	Survey position and level immediately following installation	5 days prior to placement of earthworks in the surrounding area above level of gauge	Daily (Monday to Friday) until 15 days have elapsed past completion of surcharge earthworks. Then twice weekly until one month has elapsed.	Weekly for the three subsequent months and then monthly	Daily until 2 weeks after the surcharge is fully removed, then as advised by the Engineer subject to results from the 2 week period .
Piezometers	Daily following installation until stable reading obtained. Readings can then be suspended until commencement of sequential readings	5 days prior to placement of earthworks in the surrounding area above level of piezometers	Daily (Monday to Friday) until 15 days have elapsed past completion of surcharge construction. Then twice weekly until one month has elapsed	Weekly for the three subsequent months and then monthly	Daily until 2 weeks after the surcharge is fully removed, then as advised by the Engineer subject to results from the 2 week period.

Note: 1. This period may be extended by the Engineer if monitoring suggests insufficient diminution of settlement rate or pore pressures.

2. The surcharge removal and heave monitoring is a two phase operation as outlined below.

- 1.5.30 For each 40x40m area of treatment the twice weekly, weekly and monthly observations are to be made on the same day. To achieve this when different installations are completed at different times in one location, an initial interval shall be reduced to achieve synchronisation, rather than extended.
- 1.5.31 During the monitoring programme, the Contractor shall report on results twice a week from initial reading through to 15 days after completion of the surcharge placement, and then at weekly intervals.
- 1.5.32 The Contractor shall be responsible for preparing a final factual report (paper and pdf copy) of the instrumentation, installation and monitoring, and including graphical plots of the monitoring results. The draft reports shall be forwarded to the Engineer for comment within 2 weeks following physical completion of the works. The Contractor shall forward 2 bound copies of the final report to the Engineer the within 2 weeks of receipt of any comments from the Engineer.

Calibration Requirements

- 1.5.33 The Contractor shall test the whole instrumentation installation by taking three sets of base readings at suitable intervals and shall provide two copies of the results to the Engineer and shall satisfy him that all instruments are functioning correctly and readings are repeatable before the associated earthworks are commenced.

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- 1.5.34 After installation, the functioning and monitoring of each instrument shall be demonstrated to the Engineer, including the recording of measured values using the appropriate readout device. As part of the commissioning, three sets of readings shall be taken and compared. If there are significant differences or anomalies, then further readings shall be taken. For instruments installed prior to the earthworks commencing this process is to be repeated at the start of the earthworks. Once two sets of comparable data have been obtained, these shall be averaged to form the base reading, representing the conditions before the start of earthworks.
- 1.5.35 In cases where instruments are installed during earthworks, three sets of readings shall be taken in quick succession and the results compared. These results shall be used to provide base readings in a manner to be agreed with the Engineer.

Protection of Instruments

- 1.5.36 The Contractor shall take all necessary precautions to protect the instruments and maintain the instruments in good working order after commissioning. For all instruments which project through and above the fill, special precautions shall be taken to provide protection from vehicles and plant, including substantial and readily visible barriers at a distance of no less than 750mm around each instrument
- 1.5.37 Heavy compaction equipment shall not approach within 5m of projecting instruments. Compaction around any cabling to be by hand held tools and to be in accordance with the manufacturer's requirements.
- 1.5.38 Cables and connections are to be of a form that can withstand the subsequent placement of materials and weathering with appropriately welded joints and protection as needed to ensure they do not malfunction under loading of soils and traffic. Adequate cable slack shall be provided during installation to prevent failure as a result of stretching. If the specialist installer wishes to propose an alternative design to ensure the protection of cables this shall be submitted to the Engineer with an associated method and design 14 days prior to works and subject to the Engineer's approval. The cabling shall not be placed within the Engineered Fill as this could present a potential hydraulic pathway.
- 1.5.39 Adequate protection measures shall be provided for all new and existing instrumentation to protect it from vandalism or damage during construction.
- 1.5.40 Any damage to instruments or cabling shall be reported immediately to the Engineer. Damaged instruments and cabling shall be replaced or repaired by the Contractor at his own expense within seven days of its reported damage.
- 1.5.41 Should any settlement monitoring location be damaged or moved, a new level should be taken on the damaged rod immediately and the incident reported to the Engineer. Earthworks must be suspended in that area until the problem has been resolved. Replacement of the damaged rods and plates may be required.

1.6 Surcharge Removal

- 1.6.1 The surcharge is only to be removed when instructed by the Engineer based on 1.3.9 and 1.3.10. As noted above the basal 250mm of the surcharge materials will comprise Engineered Fill. Based on a survey of the upper surface of this Engineered Fill (at the time of placement as discussed in App 6/13 Cl1.3.1) and monitoring results the contractor shall confirm that the upper surface this Engineered Fill is above final earthworks level. The contractor shall provide this confirmation a least 1 week before excavation of the surcharge commences.

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- 1.6.2 The surcharge removal is to be done in two stages comprising (i) lowering the surcharge mound by 2m and (ii) then removal of the remaining surcharge materials down to final earthworks level. During and after each stage of soil removal the settlement gauges are to be monitored. For each stage this monitoring is to continue until, to the satisfaction of the Engineer, any heave has effectively ceased.
- 1.6.3 During and after surcharge removal operations great care shall be taken by the contractor so as to prevent damage to the RSGs or other effects that could influence the results (e.g. vibrations from plant, including haulage plant) and temporary haul roads are to be constructed no closer than 10m from the RSG. Such requirements apply to the RSGs until the Engineer instructs their removal. The process for maintaining the settlement gauges during the excavation of the surcharge mound shall be proposed by the Contractor and agreed with the Engineer not less than 2 weeks prior to the removal of surcharge.
- 1.6.4 At the start of the surcharge removal operation all the RSGs are to be resurveyed. As the surcharge is removed the RSGs are to be sequentially dismantled in such a manner that they can still be used to determine movements of their respective base plates. This is to be a closely controlled operation undertaken by the contractor. Levels shall be taken of the top of the rod and the fill adjacent to the gauge on each occasion. When rods are removed, levels (including the level of the base plate upon removal of the final rod) shall be measured immediately before (on the rod to be removed) and immediately after removal (on the rod length left in situ). Good levelling practice shall be observed.
- 1.6.5 Removal of the surcharge shall be a controlled operation so as to prevent damage of the underlying Engineered Fill. Once the surcharge has been removed and once instructed by the Engineer based on 1.6.1 above, the Rod Settlement Gauges are to be grubbed out and reinstated with Engineered Fill so as to ensure that the Engineered Fill is as specified and its integrity as a low permeability layer maintained. Once the surcharge is removed down to final formation the formation is to be inspected for any soft spots or relict surcharge materials, which are to be removed and placed with Engineered Fill placed and compacted in accordance with this specification. The whole surface is to be recompacted using the same compaction technique used in its initial construction, the surface surveyed and, if required, brought up with the same materials placed and compacted in accordance with the specification.
- 1.6.6 During surcharge removal, the Contractor shall report on monitoring results (see Table 2 above for monitoring frequency) daily from commencement of surcharge removal in the vicinity of the RSG through to 2 weeks after complete removal. The need for and frequency of any continued monitoring and reporting shall be reviewed by the Engineer after the initial 2 week period.

1.7 Survey of Completed Works

- 1.7.1 On completion a full 3D topographic survey referenced to ordinance datum is to be undertaken to enable a cross check against design formations to be undertaken.

1.8 Reporting of the Surcharged Area

- 1.8.1 See Cl 1.5.31, Cl 1.5.32 and 1.6.6 for frequency of interim reporting during monitoring.
- 1.8.2 On completion of the works a detailed Ground Treatment Completion Report will be provided for the areas treated by the Contractor. The report will describe the procedures undertaken at the site and include all relevant factual data for the ground treatment works. It shall also include information needed for completion of the geotechnical feedback report as defined in Design Manual for Roads and Bridges (BMRB) HD22/08 Managing Geotechnical Risk.

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- 1.8.3 This report shall include all relevant site records and illustrate that the remedial and ground preparation works have been carried out in accordance with the design. The report is to be provided at the conclusion of the works (including the surcharge/monitoring period).
- 1.8.4 The report shall include but not be restricted to:
- any supplementary ground investigation undertaken;
 - the design information and design revisions or additional design work that arise during the works;
 - all records referred to elsewhere in this specification;
 - as built information for all materials placed;
 - acceptability tests undertaken for earthworks;
 - the results relating to trial areas;
 - full details of all instrumentation and associated ground conditions;
 - testing in relation to validation of the earthworks and monitoring and any testing undertaken to validate the settlement criteria;
 - all monitoring data associated with the works.
- 1.8.5 The report shall also include:
- daily record sheets to include a summary of the day's activities in relation to the ground improvement operations;
 - progress photographs;
 - general description of the works completed, including any earthworks, excavations (including excavations of hard obstructions or foundations), placement and compaction methodology and plant used;
 - information on weather conditions;
 - formation treatment including drainage and treatment of soft areas;
 - application of acceptability criteria and a summary of control test results sufficient to allow interpretation by the Engineer for each specific earthworks material placed during the ground improvement operations;
 - geotechnical test certificates and monitoring data including location and level, with associated drawings;
 - as built surveys (to include drawings);
 - drawings showing the location and level of each specific earthworks material placed during the ground treatment operations, any feature or operation relevant to the works including instrumentation and the location of trial areas and control tests;
 - Full as-built details of all monitoring instruments installed and associated exploratory hole records;
 - All monitoring data relating to surcharge monitoring or as otherwise required by this Specification.

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APPENDIX A

EARTHWORKS – SUPPLEMENTARY INFORMATION FOR SITE SURVEYOR

- Set out and establish the level and coordinates of a stable datum monitoring point remote from the influence of the works to which subsequent monitoring will be related.
- Set out monitoring station plate positions, using suitable co-ordinates and record the existing ground level.
- When the monitoring station plate is positioned record precisely the level of the base plate, plus the top of the first rod fitted.
- During the earthwork and surcharge operations, monitor on a daily basis the precise level of the top of rod on each monitoring station plate together with the surface level of the adjacent Engineered Fill.
- When monitoring station rods are raised during earthworks, level the top of the existing rod, top of the new rod placed and the then existing adjacent ground level.
- Survey the positions extent and levels of completed surcharge mounds for checking against design.
- Survey the finished level of the engineered material using a 25m grid and check that the design tolerances have been achieved.
- Survey the finished level of the base of the treated material using the 25m grid and check that the design tolerances have been achieved.
- Survey compliance test locations and levels within the Engineered Fill.
- Provide the foregoing services for any trial loading panels specified.
- All monitoring station levels should be recorded to an accuracy within + or – 1mm using an automatic barcode reading level.

APPENDIX 6/14: CHEMICAL LIMITING VALUES FOR SOILS

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TABLE 6/14: (11/04) LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

	Units	Upper 2.00m Engineered Fill *	General Fill Beneath 2.00m final earthworks level **
GENERAL REQUIREMENTS			
Asbestos ^c	% weight	<0.001	<0.1
Arsenic ^a	mg/kg	37	n/a
Cadmium ^a	mg/kg	26	n/a
Chromium (total)	mg/kg	910	n/a
Lead ^a	mg/kg	200	n/a
Mercury (total)	mg/kg	40	n/a
Selenium	mg/kg	250	n/a
Nickel	mg/kg	180	n/a
Copper	mg/kg	2400	n/a
Zinc	mg/kg	3700	n/a
Benzo(a)pyrene ^a (use as surrogate for PAH)	mg/kg	5.0	n/a
TPH Total ^b	mg/kg	260	n/a
Aliphatic >C5 – C6	mg/kg	42	n/a
Aliphatic >C6 – C8	mg/kg	100	n/a
Aliphatic >C8 – C10	mg/kg	27	n/a
Aliphatic >C10 – C12	mg/kg	130	n/a
Aliphatic >C12 – C16	mg/kg	1100	n/a
Aliphatic >C16 – C21	mg/kg	1100	n/a
Aliphatic >C21 – C35	mg/kg	1100	n/a
Aromatic C5 – C7	mg/kg	70	n/a
Aromatic >C7 – C8	mg/kg	130	n/a
Aromatic >C8 – C10	mg/kg	34	n/a
Aromatic >C10 – C12	mg/kg	74	n/a

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	Units	Upper 1.25m of Engineered Fill *	General Fill Beneath 1.25m below final earthworks level
GENERAL REQUIREMENTS			
Aromatic >C12 – C16	mg/kg	140	n/a
Aromatic >C16 – C21	mg/kg	260	n/a
Aromatic >C21 – C35	mg/kg	1100	n/a
Phenols	mg/kg	120	n/a
Cyanide (total) ^c	mg/kg	18	n/a
pH	Units	5 – 10	n/a
<p>* based on a residential with plant uptake end use ** 1 sample every ten will also be analysed for the full suite (i.e. as per the samples for the upper 2m engineered fill) S4ULs used unless otherwise stated (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL 3036. All rights reserved) ^a – C4SL used ^b – Based on the S4UL for Aromatic C16 – C21 but assumes no petroleum hydrocarbon contamination is present ^c – S4UL and C4SL not generated, use in-house GAC/value</p>			

1.0 LABORATORY AND SAMPLING REQUIREMENTS ARE PROVIDED BELOW

1.1 Purpose

1.1.1 The works specified herein are required to ensure a minimum standard for the preparation and receipt of analytical data from the works for comparison to the Limiting Values set for the works. The Contractor shall also satisfy the requirements of BS 5930 and 10175, as subsidiary standards in the completion of all fieldworks and sampling and any supplementary investigations required. In addition works shall be undertaken in accordance with the ICE Specification for Ground Investigation (2nd Ed). This document shall be read in conjunction with other related Specifications and where any ambiguity arises this shall be clarified with the Engineer.

1.2 Protocol

1.2.1 The Contractor shall supply suitably qualified specialist environmental staff to carry out the monitoring works. All sub-contractors should have in place appropriate written quality control and quality assurance procedures. Evidence of UKAS and MCERTS accreditation for the specified chemical analytical testing and testing laboratory shall be provided to the Engineer. All testing shall be UKAS and MCERTS accredited where this is currently available. All sampling, monitoring and subsequent analysis shall be documented and managed using a Chain of Custody system to track the fate of all samples. All field and laboratory analytical results shall be reported to the Engineer for review and subsequent inclusion within the Contractor's Validation Reports.

1.3 Laboratory Testing

1.3.1 All preparation, testing and reporting shall be where applicable in accordance with the relevant British Standards. Where tests are not covered by British Standards they shall be performed in accordance with the procedures in the references or as described in the Schedules. Analysis of

APPENDIX 6/14: CHEMICAL LIMITING VALUES FOR SOILS

samples will also be required for waste classification purposes. The scope of such testing shall be determined by the Contractor in accordance with the technical requirements of Environment Agency guidance for Waste Classification (EA Document WM2 as revised (assumed to be WM3 circa 2015)).

1.4 Personnel

- 1.4.1 The Contractor shall nominate an individual Technical Advisor to control all processes associated with site investigation, analysis and data management. The person should be suitably qualified. Details of the required qualifications for each of these proposed designations are given in SITE INVESTIGATION STEERING GROUP, *Site investigation on construction. Part 2: Planning procurement and quality management of site investigation*. London: Thomas Telford, 1993. This person shall be Qualified as Section 2.2e (or greater) e.g. a Chartered Engineer/Geologist/Environmental Scientist with at least 5 years of relevant experience.

1.5 Further Investigation

- 1.5.1 Where any additional site investigation, including groundwater monitoring or associated boreholes, are required, the Contractor shall submit proposals for the scope and detail of works proposed for the approval of the Engineer. This shall accord with the requirements of the technical standards noted above.

2.0 SAMPLING PROTOCOL

- 2.1 Samples of suspected contaminated ground, groundwater and leachate for chemical analysis shall be taken in accordance with BS10175 and the companion publication (UK Specification for Ground Investigation, 2nd edition (Site Investigation Steering Group, 2011) under the supervision of an appropriately qualified environmental scientist (SISG 2.2d or more).
- 2.2 The size and type of sample and container, method of sampling and time limitations for carrying out specific analyses shall be commensurate with current guidance.
- 2.3 As a minimum: soil samples shall comprise as a minimum a 1kg plastic tub and 500ml glass bottle; and, water samples shall comprise a 1l plastic and 1l glass bottle.
- 2.4 Sampling shall be undertaken such that cross contamination between samples and sampling locations does not occur. Sampling utensils shall be stainless steel and shall be cleaned prior to the commencement of the excavation works as a minimum and between holes. Where visual or olfactory evidence of contamination is noted equipment shall be cleaned between each sample retrieval.
- 2.5 All samples shall be examined and described by a suitably qualified geotechnical engineer meeting the requirements of BS EN ISO 14688-1:2002. Samples of suspected contaminated ground and leachate shall be described by a qualified environmental or geotechnical person meeting the requirements of SISG Clause 2.2 item d). Descriptions shall include colour and smell with reference to specific inclusions.
- 2.6 All samples shall be labelled with sample location, depth, sample ID (job number, client reference, AGS sample type), time and date of collection. All samples for contamination analysis shall be stored and transported in cool boxes with pre-frozen ice packs and submitted directly to the laboratory from the site within 24hrs of sampling. Samples shall be protected to ensure that their temperature does not fall below 2°C or rise above 45°C. They shall also be protected from direct heat and sunlight.

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- 2.7 A 'Chain of Custody' form shall accompany each batch of samples with a copy retained on-site during works and submitted to the Engineer with the exploratory hole logs. The Chain of Custody shall include the sample details in full combined with any special instructions indicated by the Engineer.

3.0 LABORATORY & ANALYTICAL METHODOLOGY ACCREDITATION**3.1 Accreditation**

- 3.1 The Contractor shall select laboratories which are compliant to ISO 17025 and MCERTs. Where necessary, the Contractor may need to use a range of laboratories to ensure that all reported results meet these accreditations. In particular, it is noted that all asbestos testing must be undertaken by a laboratory who are ISO 17025 accredited for the test. With respect to asbestos in soils analysis the laboratory proposed must have undergone an inspection in accord with UKAS ABS001 note during 2011.

4.0 DATA MANAGEMENT

- 4.1 All chemical data shall be provided in Adobe PDF, 'CrossTab' collated Microsoft Excel, and validated AGS 4.0 format. AGS data shall be complete with wider site data such as stratigraphy and sample coordinates. AGS data shall be compiled into a single file by the Contractor and forwarded to the Engineer on a weekly basis.
- 4.2 All laboratory test results must be submitted in **full** accordance with The Association of Geotechnical and Geoenvironmental Specialists (AGS) version 4 standard (available on the AGS website: <http://www.ags.org.uk/site/datatransfer/intro.cfm>). Each AGS data file must be checked for errors (i.e. must not contain warnings, structural or integrity errors) before it is submitted and it must be accompanied by an error log file to verify.
- 4.3 On receipt of the AGS file, the Engineer will check for errors before loading it into its central database. If any errors are found, the data shall be returned to the Contractor (accompanied with an error log file detailing all errors) for corrections and editing.
- 4.4 The Engineer will not accept and will return to the Contractor any data that does not meet the AGS standards or has not been checked (i.e. is not accompanied by an error-free log file).
- 4.5 In addition to the above requirements, chemical analysis spread sheets shall be provided in:
- Excel spread sheet format that shall follow a consistent order and format for rows and columns to allow direct referencing across a given row/column for either a single determinant across all exploratory samples or vice versa all results for a single exploratory sample;
 - Separate sheets shall be provided for the analysis results for soil, water, leachate and gas;
 - Each of the spread sheet fields shall be populated free of hidden data, spaces, or other insertions (other than explained symbols) that inhibit interpretation of data;
 - The detection limit applicable to each chemical analysis, agreed at appointment, shall remain consistent throughout the works; and,
 - The units of expression shall be consistent (e.g. micrograms or milligrams) and shall remain consistent throughout the works for a given medium and parameter.

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5.0 DATA QUALITY

- 5.1 Provision shall be made for a suitable quantity of blanks and duplicate sampling to be collected and analysed in order to express the sampling and analytical error.

6.0 DATA MANAGEMENT SYSTEM

- 6.1 The Contractor shall maintain a data management system in order to coordinate all validation testing, appraisals and reporting. This shall be kept current with works with a delay of no more than 2 weeks from the point of a given sample.
- 6.2 The Contractor shall provide the Engineer with results upon request and present a summary of results at the Progress Meetings of works.

Appendix E

Kilnwood Vale Phase 2.4 – 2.6 Earthworks Specification (Campbell Reith, 2017c)

Kilnwood Vale Phase 2.4 – 2.6

Earthworks Specification

For

Crest Strategic Projects

Project Number: 11950

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Kilnwood Vale Phase 2.4-2.6

EARTHWORKS SPECIFICATION

Project Specification Revision Record

Date	Revision	Clause Revisions	Prepared By	Checked By
25/05/17	A		AED/SMB	AED

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT

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SERIES 600: EARTHWORKS SPECIFICATION REVISION

The Specification shall be the 'Manual Contract Documents For Highway Works Specification of Highway Works', February 2017 (SHW), produced by the Highways Agency, as amended and added to by the Appendices contained within this document.

Appendix No.	Title.
0/3	List of numbered appendices referred to in this specification and included in the Contract
0/4	List of drawings included in the Contract
	PRELIMINARIES
1/5	Earthworks Testing
	EARTHWORKS
6/1	Requirements for Acceptability & Testing of Earthworks Materials
6/2	Requirements for Dealing with Class U1B and U2 Unacceptable Materials
6/3	Requirements for Excavation, Deposition, Compaction (Other than Dynamic Compaction)
6/8	Topsoil
6/12	Instrumentation and Monitoring
6/13	Ground Improvement
6/14	Limiting Values for Harm to Human Health and Environment

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

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A list of Drawings is included below:

PHASE 2.4

Contractor to refer to current issue sheet as drawings likely to be updated iteratively.

Drawing No.	Drawing Title
11950-CE420	PHASE 2.4B: EARTHWORKS FINISHED LEVELS AND CONTOURS
11950-2.4A-CE420	PHASE 2.4A: EARTHWORKS FINISHED LEVELS AND CONTOURS
11950-2.4C-CE420	PHASE 2.4C: EARTHWORKS FINISHED LEVELS AND CONTOURS
11950-2.4D-CE420	PHASE 2.4D: EARTHWORKS FINISHED LEVELS AND CONTOURS
11950-2.4E/F/G/H-CE420	PHASE 2.4E/F/G/H: EARTHWORKS FINISHED LEVELS AND CONTOURS
11950-CE421	PHASE 2.4B: EARTHWORKS EXCAVATION FORMATION LEVELS
11950-2.4E/F/G/H-CE421	PHASE 2.4E/F/G/H: EARTHWORKS EXCAVATION FORMATION LEVELS
11950-2.4E/F/G/H-CE422	PHASE 2.4E/F/G/H: EARTHWORKS TOP OF SURCHARGE LEVELS
11950-2.4A-CE423	PHASE 2.4A: EARTHWORKS INSTRUMENTATION AND MONITORING
11950-2.4B-CE423	PHASE 2.4B: EARTHWORKS INSTRUMENTATION AND MONITORING
11950-2.4C-CE423	PHASE 2.4C: EARTHWORKS INSTRUMENTATION AND MONITORING
11950-2.4D-CE423	PHASE 2.4D: EARTHWORKS INSTRUMENTATION AND MONITORING
11950-2.4E/F/G/H-CE423	PHASE 2.4E/F/G/H: EARTHWORKS INSTRUMENTATION AND MONITORING
11950-CE424	PHASE 2.4-2.6 INDICATIVE SURCHARGE DESIGN
11950-SK107	PHASE 2 AND 3 PARCEL DELIVERY PROGRAMME
11950-SK53	FILL IN AREAS OF STEEPENED MADE GROUND BATTER
11950-SK135	PHASE 2.4B EARTHWORKS SECTION A
11950-SK151	ENGINEERED FILL TIE IN DETAIL
11950-CE202	BEWBUSH BROOK DIVERSION PROPOSED LAYOUT AND EXISTING GROUND
11950-CE203	BEWBUSH BROOK DIVERSION PROPOSED/EXISTING GROUND
11950-SK147	BEWBUSH BROOK DIVERSION OPTION 1 1:2.8 BANKS WITH RETAINING WALLS

PHASE 2.5

To be confirmed

PHASE 2.6

To be confirmed

APPENDIX 1/5: EARTHWORKS TESTING

TABLE 1/5A: FOR USE WHEN SOILS ARE PROCESSED AT THE POINT OF FINAL PLACEMENT

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
	1	General Granular Fill	Grading (U) and UC	Included with Routine Testing	1 per 1000m ³ ⁽ⁱ⁾	Required for all tests	Refer to Table 6/1 of Appendix 6/1 for method of determining the OMC and MDD.
			MC (U)	Included with Routine Testing	1 per 250m ³ ⁽ⁱ⁾		
			OMC/MDD (U) and Particle Density (U)	Included with Routine Testing	At each insitu density test ⁽ⁱⁱ⁾		
			pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	Included with Routine Testing	1 per 3000m ³		
			Forensic TOC tests in accordance with CLAIRE RB17	Included with Routine Testing	1 per 500m ³		
			Drum Test	Included with Routine Testing	1 per 2500m ³		
			Chemical Analysis (U)	Included with Routine Testing	1 per 2500m ³		
	2	General Cohesive Fill	Grading (U)	Included with Routine Testing	1 per 500m ³ ⁽ⁱ⁾	Refer to Appendix 6/12 for method of Drum Tests.	
			Sedimentation Analysis by Pipette (U)	Included with Routine Testing	1 per 5 Gradings		
			PL/LL (U)	Included with Routine Testing	1 per 1000m ³ ⁽ⁱ⁾		
			MC(U) or MCV(U)	Included with Routine Testing	1 per 250m ³ ⁽ⁱ⁾		
					Refer to Notes beneath this Table for additional clarifications including those for F.TOC tests.		

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
						Required for all tests	
			Undrained Shear Strength using HSV	Included with Routine Testing	As required in relation to 'Compaction of Fills' below.		
			OMC/MDD (U) and Particle Density (U)	Included with Routine Testing	At each insitu density test ⁽ⁱⁱ⁾		
			pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	Included with Routine Testing	1 per 3000m ³		
			Drum Test	Included with Routine Testing	1 per 2500m ³		
			Chemical Analysis (U)	Included with Routine Testing	1 per 2500m ³		
			Forensic TOC tests in accordance with CLAIRE RB17	Included with Routine Testing	1 per 500m ³		
		Permeability (U)	As per compaction Trial	N/A			

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
612	Compaction of Fills					Required for all tests.	More tests may be required pending monitored performance.
			Field Dry Density (including air voids) (U) HSV(U)		1 per 35m x 35m grid per layer on placed and compacted materials. 1 per 70x70m grid per layer on placed and compacted materials.		
			Infiltration Rate via Soakaway Test		Upon completion of filling. 1 per 100x100m, with a minimum of 3 No per individual phase.		
			Insitu CBR using plunger (U)		1 per 35m x 35m grid per layer on placed and compacted materials. Top two layers only.		
			Insitu CBR using Plate Load Test(U)		1 per 70m x 70m on final layer.		

Test Frequency Notes:

- (i) Or, per layer, or per day of earthworks (whichever gives the highest number of results). This may be modified by the Engineer where only small volumes of fill are placed and treated, for example where <math> < 300\text{m}^3 </math>.
- (ii) The need for such testing is to be reviewed based on the Engineer's judgement of the Contractor's processing operation, visual assessment of how homogenous the processed material has become and on laboratory test results. The Engineer shall review how much consistency is being achieved in the processed material from the laboratory compaction tests, particle density and moisture content results and potentially reduce the need for the laboratory testing based on findings.

TABLE 1/5B: FOR USE WITH PROCESSED STOCKPILED SOILS THAT HAVE BEEN SEGREGATED BY SHW MATERIAL CLASS, OR NATURAL SOILS WHICH DO NOT REQUIRE FURTHER PROCESSING AT THE POINT OF FINAL PLACEMENT.

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
	1	General Granular Fill	Grading (U) and UC	3 per source	1 per 1000m ³	Required for all tests	Refer to Table 6/1 of Appendix 6/1 for method of determining the OMC and MDD.
			MC (U)	3 per source	1 per 250m ³		
			OMC/MDD (U) and Particle Density (U)	3 per source	1 per 2000m ³		
			pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	3 per source	1 per 3000m ³		
			Forensic TOC tests in accordance with CLAIRE RB17	3 per source (on same materials used in drum tests)	1 per 500m ³		
			Drum Test	3 per source	1 per 2500m ³		
			Chemical Analysis (U)	3 per source	1 per 2500m ³		
	2	General Cohesive Fill	Grading (U)	3 per source	1 per 500m ³	Refer to Notes beneath this Table for additional clarifications including those relating to F.TOC.	
			Sedimentation Analysis by Pipette (U)	3 per source	1 per 5 Gradings		
			PL/LL (U)	3 per source	1 per 1000m ³		
			MC(U) or MCV(U)	3 per source	1 per 250m ³		
Undrained Shear Strength using HSV			3 per source	As required in relation to 'Compaction of			

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
					Fills' below.		
			OMC/MDD (U) and Particle Density (U)	3 per source ⁽ⁱⁱⁱ⁾	1 per 2000m ³	Required for all tests	
			pH (U), Total SO ₄ (U), W/S SO ₄ (U), and Total S (U)	3 per source	1 per 3000m ³		
			Drum Test	3 per source	1 per 2500m ³		
			Chemical Analysis (U)	3 per source	1 per 2500m ³		
			Forensic TOC tests in accordance with CLAIRE RB17	3 per source	1 per 500m ³		
		Permeability (U)	As per compaction Trial	N/A			

CLAUSE	WORK, GOODS OR MATERIAL		TEST	SOURCE APPROVAL	ROUTINE FREQUENCY	TEST CERTIFICATE	COMMENTS
Series 600 Earthworks							
601, 631 to 637, 640	Acceptable Limits						
	Class	General Description					
612	Compaction of Fills					Required for all tests.	More tests may be required pending monitored performance.
			Field Dry Density (including air voids) (U)		1 per 35m x 35m grid per layer on placed and compacted materials.		
			HSV(U)		1 per 70x70m grid per layer on placed and compacted materials.		
			Infiltration Rate via Soakaway Test		Upon completion of filling. 1 per 100x100m, with a minimum of 3 No per individual phase		
			Insitu CBR using plunger (U)		1 per 35m x 35m grid per layer on placed and compacted materials. Top two layers only.		
		Insitu CBR using Plate Load Test(U)		1 per 70m x 70m on final layer			

General Notes:

- 1 These general notes relate to both Tables 1/5A and Table 1/5B unless otherwise indicated.
- 2 With respect to Table 1/5B, the column entitled 'Source Approval' relates to testing of the Contractor's proposed source material, prior to placement and compaction in the works, to provide confidence that it will be acceptable. Where source approval is specified, source testing shall be carried out at each source or stockpile used.
- 3 The columns entitled 'Routine Frequency', relate to testing materials on an on-going basis during placement and compaction in the works.

- 4** The columns entitled 'Clause' in Table 1/5A and Table 1/5B are split into 2 sections: a section dealing with tests required in relation to CI 601, 631 to 637, 640 of the Specification for Highways Works and a section dealing with testing required in relation to CI 612 of the Specification Highway Works. The testing in relation to CI 601, 631, 637 and 640 is to ensure that materials are physically and chemically acceptable, and they are applicable to all soils to be used in the works. Testing in relation to CI 612 deals with testing required to ensure that End Product requirements are met. Soils for which the compaction requirement is End Product are detailed in Appendix 6/1.
- 5** Where End Product is required, a compaction trial as detailed in Appendix 6/3 CI 13.3 is to be undertaken to demonstrate that the End Products are achievable for each source of material and to give confidence that the contractor's compaction method is appropriate. The compaction trial is to be completed in accordance with App 6/3 and be witnessed by the Engineer.
- 6** Should the nature of any given test result be sufficiently unusual as to call the reliability of that test result in to doubt this to be brought the attention of the Engineer within 48hrs of its receipt by the contractor. The sample is to be examined by the testing laboratory and an engineering description provided, a test restriction issued or other formal correspondence issued by the testing laboratory and additional testing undertaken so as to confirm the behaviour of the material.
- 7** All tests are to be undertaken by a reputable independent UKAS accredited testing laboratory. So as to be consistent with the current version of the 600 series of the SHW (February 2016) all geotechnical tests are undertaken in accordance with BS1377 unless otherwise stated. It should be noted however, that parts of BS1377 have been or are in the process of being superseded by BS EN ISO 17892. As when the SHW is up dated to reflect such changes to the testing standards the Engineer is to be contacted to confirm instructions.
- 8** (U) indicates that a UKAS test report or certificate is required.
- 9** Frequency of testing applies to each separate earthworks source within each of the earthworks material classes. The testing shall be distributed evenly throughout the materials placed.
- 10** In relation to all materials placed to form the permanent works, the co-ordinates of all sample and insitu test locations are to be surveyed and recorded based on the established grid to an accuracy of 1m in plan. A unique layer number is to be recorded for all such samples/tests such that this can be correlated to survey data for each layer. Each layer of placed material is to be surveyed using topographical surveying techniques to an vertical accuracy not worse than 25mm.
- 11** Definitions of abbreviations:

 - § UC: Uniformity Coefficient
 - § MC: natural moisture content;
 - § OMC: Optimum Moisture Content;
 - § MDD: Maximum Dry Density;
 - § PL: Plastic Limit;
 - § LL: Liquid Limit;
 - § MCV: Moisture Condition Value;
 - § HSV: Hand Shear Vane;
 - § CBR: California Bearing Ratio
 - § W/S SO₄: Water Soluble Sulphate;
 - § Total SO₄: Total Sulphate;

- § Total S: Total Sulphur;
- § Forensic TOC: Forensic Total Organic Carbon

- 12** Control of moisture is to be either via the use of Moisture Content determinations or by the use of Moisture Condition Vale (MCV) apparatus. Such sampling/testing is to be undertaken just prior to compaction. Should results be outside the required range (refer to Appendix 6/1 for details) the material is to be further conditioned and retested until they are within this range just prior to compaction just prior to compaction. Moisture Condition Vale (MCV) apparatus is to calibrated against MC and undrained shear strength (Cu) at a rate of 1 set of calibrations per day of compaction.
- 13** The method of compaction test is given in Appendix 6/1 for each material type.
- 14** Particle densities shall be determined using a pycnometer or a gas jar, whichever is determined by the independent geotechnical testing laboratory as being most appropriate to the material type.
- 15** Laboratory permeability tests are to be undertaken on remoulded samples, compacted using a compaction apparatus appropriate to the material type as given in Appendix 6/1 and to be compacted to 95% maximum dry density. Testing is to be undertaken using triaxial equipment in accordance with BS1377 Part 6: 6. It is noted that this testing is related to the method trials rather than routine works.
- 16** pH, W/S SO₄, Total SO₄ and Total S tests are to be undertaken in accordance with methods prescribed in TRL Report 447.
- 17** The Contractor may propose the use of a additives to treat soil to so as ensure that the engineering characteristics of the soils used will meet with the requirements of Appendix 6/1. Treatment includes moisture conditioning, modification and stabilisation. Where treated soils are used this must be reflected in the laboratory tests undertaken. For example the samples taken to facilitate the testing must relate to materials in their treated state or mixed in the lab with same additives, to the same proportion and with same degree of mixing. If modification or stabilisation are proposed trials and suchlike are required to understand the treatment process they shall be fully agreed in advance with the Engineer. Proposals are to be submitted two weeks in advance of any such trial and the trial and associated reporting completed two week prior to use in main works.
- 18** Where treatment using lime or cement kiln dust is utilised additional allowance is required for the implementation of heave testing at the instruction of the Engineer. Heave testing to be in accordance with the procedures indicated in HA70/07 'Treatment of Fill and Capping Materials using either Lime or Cement or Both'.
- 19** For chemical analysis requirements refer to Appendix 6/14.
- 20** The chemical analysis suite will be dictated by the proposed depth of the soils tested: for the upper 2.00m of from Finished Earthworks Level the suite will comprise those determinants listed in the Upper 2.00m Engineered Fill column of Table 6/14 (11/04), Appendix 6/14. For fill placed greater than 2.00m below Finished Earthworks Level the suite will be restricted to asbestos quantification, as defined in Table 6/14 (11/04) but with 1 sample in every ten also analysed for the full suite (as listed the Upper 2.00m Engineered Fill column of Table 6/14 (11/04).
- 21** Forensic TOC analysis is to be undertaken on site won materials after they have been processed and in accordance with Cl:aire Research Bulletin 17 (November 2012), Appendix C, whereby all constituents of the Made Ground are assessed and proportioned together with a TOC percentage for the fine soil fraction. It is noted that due to the nature of the test, each sample must weigh a minimum of 10kg and the exact weight shall be confirmed by the laboratory. The selected laboratory must be agreed 2 weeks in advance of any testing with the Engineer.
- 22** Drum Tests are a bespoke form of analysis which are intended to simulate soil conditions to inform the potential for ground gas production. They are also to be undertaken on site won materials after processing and are to be used to further assess and finesse the requirement for gas protection measures. Full details are provided in Appendix 6/12.

- 23** Where HSV testing is to be undertaken to determine undrained shear strength, such tests are to be undertaken in accordance with the manufacturers user manual. The HSV is to be calibrated against the unconsolidated undrained shear strength laboratory triaxial test to BS 1377:Part 7, clause 8 on 100mm nominal diameter samples. Otherwise, shear strength testing requirements are to be as set out in Clause 633 of the Specification for Highway Works.
- 24** Field Dry Density determinations are to be either via Sand Replacement Density tests or Nuclear Density Gauges. The test must be taken to sufficient depth to ensure that the layer tested is fully penetrated. For End Product compaction testing, nuclear surface density gauges shall be permitted so long as the calibrations are deemed by the Engineer to be acceptable. Each instrument in use on the Contract shall be calibrated in accordance with BS 1377: Part 9, as augmented by HA70/94. With respect of both bulk density and moisture density, this is to include the manufacturer's calibrations, initial site calibrations (compliance tests for compacted material), soil calibrations and gauge standardisation procedures. If nuclear density testing used every twentieth determination shall be checked with a sand replacement test (BS1377: PART 9: 1990, Section 2). Nuclear density gauge determinations are not to be undertaken in soils rich in carbonaceous substances or rich in chalk. In such soils Sand Replacement Density tests are to be used.
- 25** With respect to Table 5.1A: Each insitu density test is to be accompanied by a compaction test to determine MDD and OMC and a particle density determination undertaken. Such data, along with the moisture content associated with the insitu density test will be used to determine the dry density, the %compaction and the Air Voids Ratio. All such data is to be presented on the test sheet and in a manner that enables supporting certificates to be traced. The these requirements are to be reviewed based on the Engineer's judgement of the Contractor's processing operation, visual assessment of how homogenous the processed material has become and on initial laboratory test results. The Engineer shall review how much consistency is being achieved in the processed material from the laboratory compaction tests, particle density and moisture content results and potentially reduce the need for the laboratory testing based on findings.
- 26** With respect to Table 5.1B: 2 weeks. 2 weeks prior to placement of the materials, for each stockpile/source , a suitable MDD and PD values are to be proposed by the Contractor based on source approval testing results and available routine testing results. The agreed values, along with the bulk density and moisture content associated with the insitu density tests, will be used to determine the dry density, the %compaction and the Air Voids Ratio. All such data is to be presented on the test sheet and in a manner that enables supporting data to be traced. The agreed MDD and PD values will be routinely reviewed against on any additional routine testing as the works progress and revised values agreed with the Engineer as required.
- 27** CBR tests by plunger and by plate load tests are to demonstrate a minimum CBR value of 3% at the as constructed soil moisture content. Plate load tests (min 300mm dia. plate) are to be carried out in accordance with Chapter 7 of IAN 73/06.
- 28** Infiltration rates are to be determined using soakaway tests. The tests are not be performed during periods of rainfall or when there is ponded water on the ground. These are to be undertaken in accordance with BRE Digest 365. They shall be undertaken by an AGS accredited ground investigation specialist contractor with their Method Statement agreed prior to works. The pit dimensions shall be a minimum of 1m wide 1m long and 1m deep (but shall not exceed 1.25m deep). It shall be assumed that the associated pit will need support during the test by backfilling with 10mm clean pea shingle, however, this can be omitted if the contractor can assure that the soakaway pit would otherwise remain stable throughout the test. A data logger is to be used to measure the water during test. Water must be added rapidly. The specialist ground investigation contractor is to provide full time supervision of such tests and is to provide a real time interpretation of the results.
- The duration of the tests shall be such that it can be confirmed in the field the by the specialist subcontractor that the infiltration rate is less than 1×10^{-7} m/s. The Engineer shall be informed of the findings. The test can only be terminated once the Engineer has given his approval to do so. The earthworks contactor and specialist shall work together so as to prevent water (other than that added

to perform the test) from entering the excavation. Upon completion of the test any pea shingle and the water is to be fully removed and the excavation re-instated with materials placed and compacted in accordance with this specification so as to form Engineered Fill. The contractor shall provide a report on the soakaway testing, including details of the testing undertaken, the data from the test, the specialist contractor's interpretation and tests associated with the backfilling of the excavation

- 29** The Contractor will follow all the Specification Appendices for the form of all deliverables, storage of test records and storage of records of materials imported to and exported from site.
- 30** Should for any reason materials be imported into the site for use as fill, unless specifically instructed to the contrary, all samples used for testing materials to be incorporated into the works shall be taken from materials after they have been delivered to the site, (where imported) and in such case with 7 days notice to the Engineer so as to review requirements.
- 31** Unless otherwise shown in this Appendix, tests and test certificates for works, goods or materials as scheduled under any one clause are required for all such work, goods or materials in the works.

**APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF
EARTHWORKS MATERIALS**

1.0 Acceptable Limits for Fill Materials

- 1.1 Earthworks materials shall comply with the 600 series of the Highways Agency 'The Manual of Contract Documents for Highway Works, Volume 1: Specification for Highway Works' (SHW) and with the particular requirements of this Appendix. Permitted classes of construction materials are defined in Appendix 6/1, Table 6/1: Acceptable Earthworks Materials: Classification and Compaction Requirements.
- 1.2 All earthworks materials are to meet the acceptability limits as set out in Appendix 6/1, Table 6/1 and SHW Table 6/2.
- 1.3 Unacceptable Material Class U1A shall be:
- § material which does not comply with the permitted constituents and material properties of Table 6/1 and Appendix 6/1 for acceptable material;
 - § peat, materials from swamps, marshes and bogs;
 - § logs, stumps and perishable material;
 - § potentially deleterious materials;
 - § potentially degradable material that presents a future source of gas;
 - § material that exceeds the Forensic TOC content limit of 4%;
 - § materials in a frozen condition;
 - § clay having a liquid limit determined in accordance with BS1377 : Part 2, exceeding 90% or plasticity index determined in accordance with BS1377 : Part 2, exceeding 65%;
 - § material susceptible to spontaneous combustion; and
 - § material contaminated with vegetative matter including invasive plant species.
- 1.4 Unacceptable material Class U1B shall be:
- as defined in SHW;
 - contaminated, noxious or deleterious materials;
 - asbestos containing material.
- 1.5 Fill materials will generally comprise:
- Class 2 to provide: Engineered Fill. Placed and compacted to meet the End Product requirements.
 - Class 6 material: used for starter layers, sub-formations and working platform fill below water.

- 1.6 Material designated as Class U1A due to physical properties that fall outside those permitted in Appendix 6/1, Table 6/1, Table 6/2 may be physically processed and conditioned to obtain the appropriate classification.
- 1.7 Where possible U1A oversized materials are to be processed to meet the 'recycled aggregate' requirements of Clause 601.12 of SHW and the target acceptability limits as set out in Table 6/1, SHW Table 6/2 and site specific requirements.
- 1.8 When rendering Class U1A material acceptable by lime (quicklime) or another alternative agreed (e.g. ckd) the Contractor shall demonstrate that any swell/heave does not cause damage to overlying materials and that the finished surface remains within the specified tolerances. The method of spreading lime is to provide for a controllable rate of application, even spreading, and for the percentage lime added to be either directly measured or readily calculable. The Contractor is to be responsible for obtaining and keeping full and detailed records of where lime modified material has been incorporated within the works.
- 2.0 Special Requirements for Determining Acceptability, and Whether Sampling and Testing is Required**
- 2.1 The Contractor shall carry out Acceptability and End Product Compaction Testing in accordance with Specification Appendix 6/1, Table 6/1 and at the frequencies given in Appendix 1/5 in an independent UKAS accredited testing laboratory. Each sample and in-situ test shall be identified by a unique identification number directly referenced to both the sample type, location and position.
- 2.2 Testing shall be the responsibility of the Contractor and be carried out in accordance with Specification Appendices 1/5, 6/1 and 6/3. The Contractor shall maintain full records on each sub-unit of materials, including but not limited to, the location of the sources, the suppliers details, the acceptability testing and the location it has been incorporated within the works. This also applies to Client sourced materials.
- 2.3 Should any material be placed which has not been given prior approval from the Engineer, the Contractor will have done this at its own risk and shall be responsible for any remedial works required to rectify the situation. In this regard, it is noted that the Engineer shall not be assumed to be present on site on Saturdays and works shall accommodate this. All costs associated with any remedial works or actions shall be borne solely by the Contractor.
- 2.4 The Contractor shall undertake testing of fill materials to determine their acceptability with respect to meet the compaction requirements given in this specification. A copy of the results of such testing shall be provided to the Engineer in paper hard copy and digital format (pdf, excel and AGS 3.1). With respect to provision of AGS data, all laboratory test results shall be submitted in full accordance with The Association of Geotechnical and Geo-environmental Specialists (AGS) version 3.1 standard (available on the AGS website: <http://www.ags.org.uk> under 'datatransfer'). Each AGS data file must be checked for errors (i.e. must not contain warnings, structural or integrity errors) before it is submitted and it must be accompanied by an error log file to verify
- 2.5 Results of source approval tests are to be provided within 10 days of testing being completed and prior to the materials being placed, with the exception of drum test as detailed elsewhere in this specification. Results of routine tests are to be provided with 10 working days of sampling with the exception of:
- MC tests; to be provided within 24hrs of sampling

- MCV tests; to be provided within 24hrs of testing
- Compaction tests: to be provided within 5 working days of sampling
- Particle Density tests: to be provided within 5 working days of sampling
- Drum Tests: As detailed elsewhere in this specification

2.6 Hand shear vane tests, insitu density and CBR related tests are to be undertaken on the day of compaction and the results provided within 24hrs of testing. Dates for soakaway testing are to be agreed with the engineer.

3.0 Permitted Use of Rapid Assessment Procedure for Material Acceptability

3.1 Where moisture content is undertaken as the method of material classification and control, the Contractor may use a 'rapid' method (e.g. microwave oven) as an alternative to the BS1377: Part 2 method provided that such 'rapid' methods are calibrated weekly against conventional BS methods using drying ovens. The 'rapid' procedure will need to be UKAS accredited or a documented in house procedure.

4.0 Requirements for the Assessment of the Effects of Water Soluble (WS) Sulphate, Oxidisable Sulphides and Total Potential Sulphate in Accordance with TRL 447, Test Nos. 1 to 5

4.1 Water soluble (WS) sulphate, oxidisable sulphides and total potential sulphate contents are to be determined in accordance with Clause 644 of SHW.

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

TABLE 6/1: ACCEPTABLE EARTHWORKS MATERIALS: CLASSIFICATION AND COMPACTION REQUIREMENTS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class				
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			Lower	Upper	2	A	-
GENERAL COHESIVE FILL	2	A	-	Wet cohesive material	General fill	Any material, or combination of materials other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: · an undrained shear strength of 50 kN/m ² or more · at least 95% Maximum Dry Density · not more than 5% air voids in top 2m. (Air voids can be relaxed to not more than 10% where used at a depth of >2m below the top of the Engineered Fill surface). · A permeability of not more than 1x10 ⁻⁷ m/s · CBR 3% at as placed moisture content where used in top 2 layers of Engineered Fill. Where Hydraulic Binders are used maximum TPS is 1%.	2	A	-		
							(ii) D10	BS1377-2	-	0.003mm						
							(iii) Plasticity Index (PI)	BS 1377-2	6	40						
							(iv) mc	BS 1377-2	That associated with end product requirements as determined by testing							
							(v) MCV	Clause 632								
							(vi) Permeability of remoulded material	Appendix 1/5 note 15	-	10 ⁻⁷ m/s						
							(vii) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%						
							(viii) Chemical analysis	App 6/14	App 6/14							
							(ix) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14							
							(x) Undrained shear strength of remoulded material.	Hand shear vane	50 kN/m ²	-						

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class			General Material Description	Typical Use	Permitted Consituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612		Class		
						Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:						
								Lower	Upper					
GENERAL COHESIVE FILL	2	B	-	Dry cohesive material	General fill	Any material, or combination of materials other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	2	B	-
							(ii) D10	BS1377-2	-	0.003mm				
							(iii) Plasticity Index (PI)	BS 1377-2	6	40				
							(iv) mc	BS 1377-2	That associated with end product requirements as determined by testing					
							(v) MCV	Clause 632						
							(vi) Permeability of remoulded material	Appendix 1/5 note 15	-	10 ⁻⁷ m/s				
							(vii) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%				
							(viii) Chemical analysis	App 6/14	App 6/14					
							(ix) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14					
							(x) Undrained shear strength	Hand shear vane	50 kN/m ²	-				

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class					
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			2	C	-			
						Lower	Upper							
GENERAL COHESIVE FILL	2	C	-	Stony cohesive material	General fill	Any material, or combination of materials other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	2	C	-
							(ii) D10	BS1377-2	-	0.003mm				
							(iii) Plasticity Index (PI)	BS 1377-2	6	40				
							(iv) mc	BS 1377-2	That associated with end product requirements as determined by testing					
							(v) MCV [where not possible to determine, acceptability shall be by civils	Clause 632						
							(vi) Permeability of remoulded material	Appendix 1/5 note 15	-	10 ⁻⁷ m/s				
							(vii) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%				
							(viii) Chemical analysis	App 6/14	App 6/14					
							(ix) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14					
(ix) Undrained shear strength	Hand shear vane	50 kN/m ²	-											

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			
						Lower	Upper		
GENERAL COHESIVE FILL	2 D - Silty cohesive material	General fill	Any material, or combination of materials (excluding those listed in SHW Clause 6.1.2 (i) (b)) other than material designated as Class 3 in the contract	(i) Grading	BS 1377-2	SHW Table 6/2	SHW Table 6/2	MDD determined using 2.5kg Rammer. Except for materials with liquid limit greater than 50, only deadweight tamping or vibratory tamping rollers or grid rollers shall be used. End Product Compaction to achieve: As per Class 2A above Where Hydraulic Binders are used maximum TPS is 1%.	2 D -
				(ii) Plasticity Index (PI)	BS 1377-2	6	40		
				(iii) D10	BS1377-2	-	0.003mm		
				(iv) mc	BS 1377-2	That associated with end product requirements as determined by testing			
				(v) MCV [where not possible to determine, acceptability shall be by (iii)]	Clause 632				
				(vi) Permeability of remoulded material	Appendix 1/5 note 15		10 ⁻⁷ m/s(v)		
				(vii) Forensic TOC	Cl:aire RB17 (Nov 2012)	-	Total combined Forensic TOC 4%		
				(viii) Chemical analysis	App 6/14	App 6/14			
				(ix) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14			
				(x) Undrained shear strength of remoulded material	Hand shear vane	50 kN/m ²	-		

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class	General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
				Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			5	A	-
						Lower	Upper				
TOPSOIL	Topsoil, or turf, existing on site	Top soiling	Topsoil or turf designated as Class 5A in the Contract	(i) Grading	SHW Clause 618	-	SHW Clause 618	-	5	A	-
				ii) Properties as required by BS 3882	BS 3882	To meet with requirements given in BS 3882					
				iii) Chemical analysis	App 6/14	App 6/14					
				(iv) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14					

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			6	A	-
									Lower	Upper				
SELECTED GRANULAR FILL	6	A	-	Selected well graded granular material	Below water	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock, chalk or colliery spoil), blast furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	No compaction	6	A	-
							(ii) Uniformity coefficient	See note 5	10	-				
							(iii) Plasticity Index (PI)	BS 1377-2	Non-plastic					
							(iv) Chemical analysis	App 6/14	App 6/14					
							(v) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14					

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			6	B	-
									Lower	Upper				
6	B	-		Selected coarse granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock, chalk or colliery spoil), blast furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	SHW Table 6/4 Method 5	6	B	-
							(ii) Plasticity Index (PI)	See note 5	10					
							(iii) Chemical analysis	App 6/14	App 6/14 Threshold Concentration is dependent on depth – refer to Table 6/14					
							(iv) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964						
							(v) Los Angeles coefficient	SHW Clause 635	-	50				

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY AND TESTING OF EARTHWORKS MATERIALS

Class				General Material Description	Typical Use	Permitted Constituents (All Subject to Requirements of Clause 601 and Appendix 6/1)	Material Properties Required for Acceptability In Addition to Requirements on Use of Fill Materials in Clause 601 and Testing in Clause 631				COMPACTION REQUIREMENTS IN CLAUSE 612	Class		
							Property (See Exceptions in Previous Column)	Defined and Tested in Accordance with:	Acceptable limits Within:			6	C	-
Lower	Upper													
6	C	-	Selected uniformly graded granular material	Starter layer	Natural gravel, natural sand, crushed gravel, crushed rock (other than argillaceous rock, chalk or colliery spoil), blast furnace slag, crushed concrete, or any combination thereof. Recycled aggregate	(i) Grading	BS 1377-2 (on-site)	SHW Table 6/2	SHW Table 6/2	SHW Table 6/4 Method 3 OMC to be determined using Vibrating Hammer	6	C	-	
						(ii) Uniformity coefficient	See note 5	-	10					
						(iii) Plasticity Index (PI)	BS 1377-2	Non-plastic						
						(iv) Chemical analysis	App 6/14	App 6/14						
						(v) Asbestos screen and ID	UKAS Gravimetric Quantification of Bulk Asbestos Products and Fibre Bundles in soils by PLM/PCOM HSG 248/HSG 264/HSE Report NO. 83/19964	Threshold Concentration is dependent on depth – refer to Table 6/14						
						(vi) Los Angeles coefficient	SHW Clause 635	-	50					
						(vii) mc & OMC/MDD	BS 1377-2 & 4	OMC -2%	OMC +2%					

Footnotes to Table 6/1:

1. App = Appendix
2. Tab = Table
3. Where BS 1377:Part 2 is specified for MC, this shall mean BS 1377:Part 2 or BS EN 1097-5 as appropriate.
4. Uniformity coefficient is defined as the ratio of the particle diameters D60 to D10 on the particle-size distribution curve, where: D60 = particle diameter at which 60% of the soil by weight is finer and D10 = particle diameter at which 10% of the soil by weight is finer.
5. The Limiting Values for Class U1B material are given in Appendix 6/14. The contents of this table may be revised following periodic Engineering assessments and design by the Engineer.
6. Where supplementary clauses and tables are referenced in Table 6/1, they shall refer to the equivalent clause or table from the Manual of Contract Documents for Highway Works, Specification for Highway Works: Volume 1: (SHW).
7. Definitions of abbreviations: Refer to Appendix 1/5

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

1 Requirements for Removal Off Site of Excavated Acceptable Material or Unacceptable Material Requiring Processing or Retention of Surplus Material On Site

1.1 Any surplus soils from form the site shall be retained on the wider Phase 2&3 site in accordance with a: location plan; CEMP; MMP; and Environmental Permit approved by the Engineer to which the contractor shall fully accord. Where material cannot maintained in accordance with the above it shall be removed from site by the Contractor in accordance with current regulations.

1.2 If any Class U1B or U2 Material is identified at excavation formation level the Engineer shall be notified and the Contractor shall prepare appropriate risk assessments to permit the completion of works. Thereafter the requirements detailed in 1.3 below shall apply and all materials shall be handled by the Contractor in accordance with Environment Agency Pollution Prevention guidance.

1.3 If visual or olfactory evidence of soil contamination is identified during the reduced level excavation works, the following actions shall be undertaken:

- work shall cease in the area of visual or olfactory contamination;
- the area of concern shall be approximately delineated and clearly marked in order that personnel or equipment shall not be permitted to enter into the area of concern;
- the soils of concern shall be inspected by the Engineer with suitable investigation equipment or operated mechanical excavator provided by the Contractor;
- suitable samples of the soils of concern shall be recovered and submitted for laboratory testing;
- suspected contaminated soils shall be excavated and suitably stockpiled in a clearly defined and segregated area whilst the results of laboratory testing are awaited, if required by the Engineer;
- following receipt of the results of laboratory testing (between three to ten days thereafter, depending upon scope of testing required) the soils may be confirmed to be contaminated or of an unacceptable nature;
- if soils are deemed contaminated or otherwise unacceptable, they shall be excavated under supervision of the Engineer and placed in a clearly demarked stockpile area pending either onsite treatment or offsite disposal;
- validation samples of the soils that remain in the vicinity of the soils of concern shall be taken by the contractor under the direction of the Engineer;
- following receipt of the results of the laboratory testing carried out on the soils that remain (between three to ten days thereafter, depending upon scope of testing required) excavation in this area can then proceed;
- the results of site inspections, laboratory testing and actions taken shall be recorded by the Contractor as a record of the works carried out;
- these records shall be compiled within the validation report for the Earthworks to provide a permanent record.

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U1B AND CLASS U2 UNACCEPTABLE MATERIALS

- 1.4 For the principle approach to stockpiling and materials movement refer to Section 8.0 and 9.0 of Appendix 6/3, noting that any particular provisions of the SHW shall notwithstanding apply. The requirements for environmental monitoring and protection shall be in accordance with the CEMP.
- 1.5 There is no requirement for the remediation of Unacceptable U1B material. However such material may potentially be re-classified by the Engineer. Any U1B material that fails the prerequisite Limiting Values (Appendix 6/14) shall be referred to the Engineer for review and associated temporary stockpiles of material maintained. Unless specific approval for these materials is received from the Engineer these shall be considered U1B classification and removed. Any material that fails the Limiting Values shall not be imported to site without prior agreement of the Engineer.
- 1.6 All waste soils shall be removed and disposed of in accordance with the Waste (England and Wales) Regulations 2011 (as amended). All waste soils shall be tested and classified to permit Hazardous Properties Assessment and WAC testing in accordance with Environment Agency Guidance (WM3).

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

**APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION,
COMPACTION (OTHER THAN DYNAMIC COMPACTION)**

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

1.0 Earthworks General

- 1.1 Two weeks prior to work the contractor shall provide method statements for the works required to address this specification to the Engineer.
- 1.2 No ground disturbing activities, including any earthmoving activities, are to commence prior to the Contractor obtaining any necessary permits or licences including those relating to protected species or habitats. If a licence or permit for such works is granted, those works shall only be undertaken during the periods as stated on the licence or permit under the direction of the licence or permit holder. A copy of the licence and/or permit shall be provided to the Engineer prior to commencement of the relevant activities.
- 1.3 Setting out shall be carried out from established grid lines and maintained for the duration of the construction of the ground improvement. A minimum 10 x 10m inspection grid is required.
- 1.4 The following sequence of works is anticipated:
- Agree works Method Statements.
 - Set up permanent datum and other survey control stations.
 - Undertake compaction and treatment trials.
 - Excavate to Excavation Formation Level (refer to associated drawings)
 - Identify the engineered fill placed as part of previous works.
 - Proof roll and inspect excavation formation.
 - Complete surface monitoring and flux chamber tests (S3.0 and 4.0 of Appendix 6/12).
 - Complete Validation Trial Pits (S5.0 Appendix 6/12).
 - Remove any gaseous, soft or highly degradable materials.
 - Construct piezometers (Appendix 6/13).
 - Allow piezo readings to settle/become consistent and grout to cure.
 - Commence Drum Tests (S2.0 of Appendix 6/12).
 - Construct of Rod Settlement Gauges* (Appendix 6/13).
 - Commence monitoring in accordance with Appendix 6/13 Table 1.
 - Place/compact Engineered Fill, ensuring that the Engineered Fill placed as part of these works tie into those placed as part of the previous phases of works.
 - Place surcharge: as shown on drawings. The basal 250mm of the surcharge is to be constructed as Engineered Fill (Appendix 6/13).
 - Place gas monitoring installations (S1.0 of Appendix 6/12) and confirm with the Engineer whether any supplemental surface monitoring or flux chamber tests are required.
 - Remove surcharge after Engineer approval including continued monitoring and reporting in accordance with Appendix 6/13.
 - Grub out and decommission instruments: Place/compact Engineered Fill accordance with the Specification in areas of associated excavation.
 - Place/compact Engineered Fill to make up to Finished Earthworks Level.
 - Test Finished Earthworks Level (note other tests required as works progress).
- * Rod Settlement Gauges are to be constructed at the Excavation Formation Level
- 1.5 If during excavation undisturbed competent natural ground is encountered then the excavation is to cease and the Engineer consulted for additional instructions. The Contractor shall provide a full level survey of the associated area.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

- 1.6 At the excavation formation level, trial pits will be excavated, to inform the gas assessment and to inspect areas where the ground investigations have identified the presence of the 'poorest' material from a geotechnical point of view. The requirements are detailed in Appendix 6/12, section 5.0.
- 1.7 If unforeseen ground conditions or unforeseen responses to the treatment are encountered then the Engineer shall be verbally notified immediately (and within 48 hours in writing).
- 1.8 If Unacceptable Materials (class U1B/U2) are observed at the excavation formation then provision shall be made for these to be removed following instruction from the Engineer. Any associated 'hotspot' excavations shall be validated by the Contractor via the application of Forensic TOC tests comprising on composite sample per face and one composite sample from the base. Each spot will be surveyed to include base levels and lateral extents such that volumes can be calculated.
- 1.9 Surcharging operations and associated monitoring are detailed in Appendix 6/13.
- 1.10 Earthworks materials derived from processed Class U1B material are to be used in the works only when agreed with the Engineer. This shall be recorded in the As-Built Drawings.
- 1.11 The Contractor is responsible for the works covered by the Specification. The Contractor shall however require the inspection and approval of works from the Engineer subject to the notice periods presented in the Contract (and a minimum of 7 days) and in particular inspection of:
- a. Excavation formations
 - b. Classified stockpiles
 - c. Material placement and compaction (of permanent fills)
 - d. Unforeseen contamination (Class U1B / U2 Materials)
 - e. Validation trial pits
 - f. Completed works following removal of surcharge
 - g. Instrumentation and monitoring
- 1.12 A tracking system shall be established to the satisfaction of the Engineer to document material movements from excavation to segregation, stockpiling and eventual reuse. A reference grid shall be established to aid the control of material movements and shall be agreed with the Engineer prior to commencement. The proposed system shall be submitted to the Engineer 2 weeks in advance of its required use.
- 1.13 The tracking system shall enable location and extent of materials placed in any one day to be determined in three dimensional space and shall locate in-situ and ex-situ test locations the location of samples taken for laboratory tests and associated levels. This will enable excavation and removal as necessary in the event that pre and/or post placement testing indicates that the soils are unacceptable and/or placement has not achieved the required state of compaction. The tracking system should also incorporate the requirements of the MMP which includes those soils moved off the site due to surplus requirements and/or unacceptability.
- 2.0 **Control of Water**
- 2.1 All works and associated costs relating to the control and management of water on site, from existing, proposed or redundant watercourses or from any other sources including groundwater, rainfall and surface water is the responsibility of and all costs are to be borne by the Contractor.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

Any uncertainty over the issues associated with water or groundwater control shall be submitted to the Engineer for clarification, as soon as any such issue is noted or identified by any party.

- 2.2 The Contractor shall provide for such measures as may be necessary to ensure that water, whether groundwater, from precipitation or any other source does not accumulate in excavations or on sub-grades, subject to licensing and permitting requirements. In addition, the Contractor shall ensure any adjacent areas, used to source material (subject to agreement) are graded so as to shed water away from the treated area.
- 2.3 The Contractor shall provide, where necessary, temporary watercourses, ditches, drains, pumping or other means of maintaining the earthworks free from water. Such provision shall include carrying out the work of forming the earthworks in such a manner that their surfaces have at all times a sufficient minimum cross-fall and, where practicable, a sufficient longitudinal gradient to enable them to shed water and prevent ponding. This shall include the provision of temporary measures to remove water expelled from the ground due to the application of load from the Engineered Fill and surcharge material.
- 2.4 Will respect to the re-alignment of Bewbush Brook and the ponds the contractor will be responsible for both temporary and permanent works, including temporary diversion of the existing brook and temporary and permanent drainage. In relation to such features the contractor is to note the construction sequence shown on drawings.

3.0 Requirements for Groundwater Lowering or Other Treatment (where required)

- 3.1 The Contractor is responsible for all groundwater lowering where this is required for the purposes of the works. This is particularly relevant, but is not limited to, dewatering of deep excavations and trenches.
- 3.2 The Contractor is responsible for obtaining all permits and/or licences required to undertake groundwater lowering and for treatment and/or disposal of said groundwater or other encountered liquids.
- 3.3 Where earthworks operations or ground improvement measures result in the expelling of groundwater into drainage layers or onto earthworks surfaces the discharged water shall be collected, treated if necessary and disposed.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

4.0 Blasting for Excavation

4.1 Blasting for excavation is not a permitted alternative to normal excavation methods.

5.0 Stability of Excavation

5.1 Where the area to be filled comprises an existing excavation, the excavation shall be inspected and subsequently monitored by the Contractor, to ensure that there is no danger of its collapse during the works with consequences for safety, for existing buildings or for other construction adjoining. Shoring or propping shall be used where appropriate.

5.2 The Contractor shall provide appropriate barriers or other preventative measures around open excavations to minimise the health and safety risk to site users of these areas.

5.3 The Contractor shall ensure all temporary excavations are formed with suitable, safe batters or other suitable methods of support. The Contractor shall give notice without delay if any newly excavated faces are too unstable to allow work and take immediate action if instability is likely to affect structures, roadways, offsite land or the safety of the site operations.

6.0 Obstructions

6.1 An obstruction is deemed to be any material which is comprised principally of concrete, brick or stone, whether loose material or in a homogeneous form $>0.2\text{m}^3$. Where obstructions are encountered the Engineer shall be notified immediately. In ground conditions where breaking out is deemed necessary this shall be carried out by a method and to a sequence agreed with the Engineer. All breaking out methods shall be carried out to the relevant professional standards.

6.2 Where encountered during the works, obstructions shall be removed to a minimum depth of 1m below the underside of the proposed excavation formation level. Where obstructions encountered in the works extend below this depth, they shall either be removed in their entirety, or cut down, surveyed and recorded if confirmed to be deep obstructions (e.g. piles). The preferred option shall be confirmed by the Engineer.

6.3 Where the obstruction extends beyond the boundary of any zone or area to be excavated, remediated and/or treated, the obstruction shall be removed 1m beyond the boundary except where this extends beyond the demise of the client's ownership or interferes with a permanent structure (such as adjacent building or footpath).

6.4 Where any obstruction to be removed extends beyond the demise of the client's ownership or interferes with a permanent structure, the obstruction shall be carefully removed up to the site demise in a way that causes no damage.

6.5 All obstructions discovered shall be marked on a set of the construction drawings indicating the position, extent and a description of the materials evident together with details of any residual obstructions left in. These details shall be made available to the Engineer. Prior to any filling, the Engineer shall be given the opportunity to decide if further works should be carried out beyond that specified. In the event of a residual obstruction being left insitu its location, extent and level are to be recorded by topographical surveying.

6.6 Where obstructions are broken out, filling or infilling of voids shall be deemed to be included with approved materials arising from the general works. Voids, pits, vents and the like shall be reported to the Engineer and shall be filled or capped with approved materials arising from the Works.

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6.7 The Contractor shall contact the Engineer before the disconnection and removal of any services comprising pipes, cables and general service installations discovered where they are above the Excavation Formation Level. These shall each be marked on a drawing and handed to the Engineer. The extent of any removal shall be within the plane of the works plus 1m where such service installations are discovered and are to be removed. The ends of any remnant pipework at the edge of any such excavation shall be cut and sealed.

7.0 Cutting Faces

7.1 No specific limitations or restrictions on undercutting are included, but the Contractor shall comply with his appointed Temporary Works Designer's requirements when excavating trenches at or within the vicinity of the toe of any slopes.

7.2 Clearing loose material from cutting slopes by airline hose is not permitted.

7.3 The Contractor shall provide additional drainage measures to intercept and discharge seepages from cutting or embankment slopes. The Contractor is responsible for all drainage required to carry out the works and to protect them upon completion, which will include, where necessary, temporary drainage measures.

8.0 Segregation of Excavated Materials

8.1 During excavation, materials arising are to be inspected and segregated to Classes U1A, U1B, U2, 5A, General Fill Classes (and further segregation as may be required to ensure adequate control of compaction behaviour). Classes U1A, U1B, U2, 5A materials must be separated.

9.0 Stockpile Management

9.1 When materials are to be stockpiled, clearly defined segregated stockpiles are to be formed for different sub-classes of processed material. The maximum permitted height of stockpiles, excluding topsoil Class 5, shall be 5.00m unless otherwise agreed with the Engineer. Stockpiles of different materials shall be clearly separated by a gap of not less than 5.00m.

9.2 Stockpiles of topsoil shall be formed in accordance with guidance provided by DEFRA '*Construction code of Practice for the Sustainable Use of Soils on Construction Sites (2009)*' and research carried out by non-statutory bodies, which suggests that optimum stockpiles of topsoil shall not exceed 1.3 m in height and that topsoil shall not be stockpiled for more than 1 year.

9.3 On completion of a stockpile the slopes shall be trimmed to falls to shed rain water and the surface sealed via compaction to limit infiltration. Temporary drainage shall be provided at the base of the stockpile to collect runoff from the stockpile and to carry any surface water away from the base of the stockpile.

9.4 The Contractor shall provide and maintain such measures as necessary to eliminate the production of dust from the stockpile during the its life.

Existing Stockpiles

9.5 The earthworks carried out for previous phases of the Kilnwood Vale development has resulted in the formation of various stockpiles of potentially acceptable fill materials. The existing stockpiled materials may also be reused provided they are or can be demonstrated as having been subject to the testing as defined in Appendix 1/5 and meet the criteria given in Appendix 6/1.

9.6 The Contractor shall include details of the movement of these soils in the Materials Tracking documentation as detailed in Section 1.0 of Appendix 6/3.

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10.0 Geotechnical Methods for Soil Treatment

- 10.1 The Contractor shall provide moisture conditioning, modification and solidification/ stabilisation and physical treatment to render soils suitable under in accordance with Appendix 6/1, Table 6/1 and Table 6/2.
- 10.2 Moisture conditioning is defined as works that may be required to ensure that stockpiled or as dug materials comply with the requirements of this specification and the Specification for Highways Works. These are processes where, either through the addition of chemicals such as lime, or through physical processes such as spreading out and air drying, the moisture content of the soils may be rendered acceptable for earthworks.
- 10.3 The physical treatment of unacceptable materials is defined as physical screening/crushing of stockpiled or as-dug soils to remove timber, wood, potentially deleterious materials and oversized fragments of bricks, concrete and the like.
- 10.4 Rendering SHW Class U1A material acceptable by lime (quicklime) modification (or other additives) is permitted provided the modified material is able to meet the performance requirements given and that it or its method of placement do not result in a risk to the environment. The design of any such treatment shall be based on HA70/07 'Treatment of Fill and Capping Materials using either Lime or Cement or Both'. The Contractor shall demonstrate, to the satisfaction of the Engineer, that the treated materials do not have any significant potential to swell/heave. The method of spreading the additives is to provide a controllable rate of application and even spreading. It shall also enable the percentage of additives added to be either directly measured or readily calculable.
- 10.5 The Contractor shall be responsible for obtaining and keeping full and detailed records of where treated/modified material has been incorporated within the works.
- 10.6 Prior to undertaking any such soil treatment the Contractor shall submit full details to all relevant statutory authorities and the Engineer and obtain their approval to his proposals. The Contractor's attention is brought to the environmental sensitivity of the site and any such works must be undertaken in full compliance with the relevant statutory authority requirements and the requirements of the agreed Construction and Environmental Management Plan.

11.0 Water Courses

- 11.1 Details regarding existing water courses, construction of new water courses and earthworks drainage ditches are shown on the Drawings provided by the Engineer.
- 11.2 Redundant watercourses shall be drained and cleaned. Excavated arisings are to be treated as described in Appendix 6/2.

12.0 Construction of Fill

- 12.1 Engineered Fill: This is to comprise Class 1 and 2 material and must be compacted to achieve End Product requirements given in Appendix 6/1, Table 6/1 and as detailed below. Class 1 materials are not to be used within 2m of final earthworks level.
- 12.2 Surcharge Fill: This is a temporary fill and can be Class 1 or Class 2 material. This is discussed in more detailed in Appendix 6/13.
- 12.3 Treated Fill: Site won fill that is treated using additives. The approved method of treatment, placement, mixing and compaction shall be informed by a trial. On-going testing types and frequency beyond those already required in Appendix 1/5 shall be agreed with the Engineer after review of trials to establish an appropriate methodology.

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- 12.4 Any material placed by the Contractor prior to the provision of full testing shall be at their risk. If fill material is to be screened, processed or treated after excavation, laboratory testing shall be required after the material has been processed in order to determine its acceptability. Material will only be considered suitable, based on the results of the testing, if it is placed and compacted during a period of time in which the moisture content could not have varied outside of the appropriate range to meet the compaction requirements.
- 12.5 After materials have been brought up to Finished Earthworks Levels where required, ground improvement via the use of a surcharge to preload the ground will then be undertaken as shown on the drawings. Full details of the surcharge operation are given in Appendix 6/13. Subsequent to the removal of the surcharge, site levels are then to be brought back up by Engineered Fill materials which will be placed and compacted to meet End Product requirements. It is noted that the surcharge material does not generally have an End Product requirement, apart from the basal 250mm. The basal 250mm shall be placed and compacted as Engineered Fill to allow for settlement and the residual of this removed following surcharge completion.
- 12.6 Embankment slopes shall not be constructed steeper than that considered safe by the contractor's temporary works engineer. Temporary over-widening or steepening to achieve adequate compaction of the shoulders of the embankment are permitted.
- 12.7 Any sub-formation areas requiring protection against weather should be protected in accordance with SHW.
- 12.8 Formations for earthworks construction and cutting formations shall be proof-rolled using as a minimum, the compactive effort detailed in SHW. This compactive effort shall be increased for cutting formations where different compactive efforts, dependent on the type of follow-on earthworks operations, are required by the Specification. Observations shall be made by the contractor to identify soft spots. The identification of a 'soft spot' is qualitative and depends on the response of the ground to the compactive effort during proof-rolling. As a minimum excessive matting, bow-waving or ground heave shall be indicative of a 'soft spot'. The Contractor shall agree with the Engineer the extent and nature of 'soft spot' treatment. The extent of the soft spot and associated treatment are to be recorded.
- 12.9 As part of the requisite compaction trials, consideration for dealing with soft spots shall be addressed by the contractor and agreed with the Engineer.
- 12.10 The earthworks construction formations and cutting formations shall be inspected by the Engineer for the possible presence of any soils that have visual or olfactory evidence of contamination and/or the presence of any significant concentrations of organic or decayable material. The contractor shall agree with the Engineer on the course of action to be taken where such 'hot spots' are encountered.
- 12.11 Fill shall be placed and compacted in near-horizontal layers of the thickness required to achieve the required end product and shall, as far as practicable, be brought up at a uniform rate so that all parts of the site reach Finished Earthworks Levels at the same time.

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- 12.12 Where different thicknesses of fill material are to be employed, the thickness shall be benched to ensure that differential settlements are minimised.
- 12.13 No fill shall be placed and left uncompacted at the end of a working day. Compacted fill shall be sealed and graded to falls to ensure free runoff of rainwater without ponding.
- 12.14 Compaction plant and compaction method shall be selected having regard to the proximity of existing trenches, excavations, retaining walls, monitoring installations or other structures and all work shall be performed in such a way as to ensure that their existing stability is not impaired.
- 12.15 After removal of surcharge (Appendix 6/13) material exposed is to be proof rolled as per the compaction method used for the Engineered Fill.

13.0 Compaction**13.1 General**

- 13.1.1 All materials shall be placed and compacted to achieve the associated End Product requirements as given in Appendix 6/1 of this specification. The compaction techniques to be adopted for materials are to be informed by compaction trials as outlined below.

13.2 Use of Nuclear Density Gauges

- 13.2.1 Refer to Appendix 1/5 Note 24.

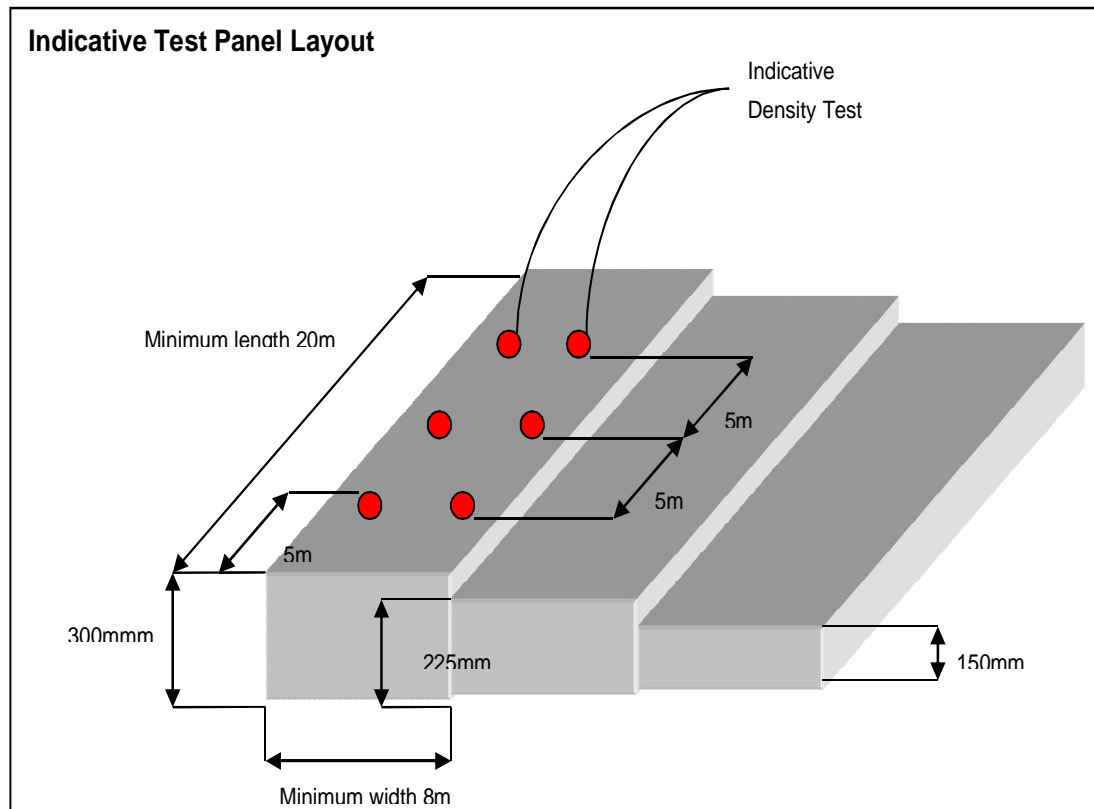
13.3 Compaction Trial For Engineered FillInitial Considerations

- 13.3.1 Compaction trials are required for each material source to be used in the main works and, in relation to such materials, for each compaction method to be used. Compaction trials shall be undertaken with the Engineer in attendance. Two week notice is to be provided and two weeks prior to the trial the Contractor shall provide the Engineer with the geotechnical and chemical results relating to the source material suitability testing. The contractor shall plan his works so as to ensure that compaction trial and associated testing and appraisal is complete in good time in advance of the main works. Failure to do so will result in materials being placed at the contractor's risk. The site of the trials shall be clearly marked and levels taken to determine the thickness of each layer before and after compaction.
- 13.3.2 The exception to the above is where the same materials have been placed and compacted in previous phases of work and where it is has been possible to demonstrate that the End Product requirements considered herein have been met for the method of compaction that the contractor proposes to use. Approval of the omission of a compaction trial would be required in writing from the Engineer, however, subject to confirmation of proposed plant and method as described in CI 13.3.5. This must be sought at least 2 weeks prior the scheduled commencement of the compaction trial. The scheduled commencement of the compaction trial must be in good time in advance of the placement of permanent fill as outlined above.
- 13.3.3 For each material type, a number of test panels will be required in order that a full assessment of the material and compaction method can be completed, which would then constitute the Compaction Trial. Although the size of each panel will reflect the size of the compaction plant and methodology of work proposed, a minimum width of 10m by 20m in length is recommended, with a number of different layer thicknesses trialled as indicated in the Figure

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below. Any existing topsoil shall be removed from the area of the compaction trial and the formation proof rolled and inspected for soft spots as described in Cls 12.8 and Cl12.9.

- 13.3.4 The depth of each layer forming the test panel shall reflect the likely range of depths of compacted material to be adopted in the main works, but is not to exceed a compacted layer thickness of 250mm (i.e. an uncompacted layer thickness of not more than 300mm, assuming a 20% reduction in thickness upon compaction, which is to be confirmed by the compaction trial). Each panel shall be made up using the layer thickness being trialled until the total thickness for each trial panel is not less than 1m



- 13.3.5 Each test panel shall be laid out and clearly identified and defined separately from any other test panel to avoid accidental influence from adjacent works. At least 2 weeks prior to undertaking the trial, the Contractor shall confirm to the Engineer the following:
- What compaction plant is to be used, including but not limited to the type of equipment, manufacturer, mass per meter width and any other relevant information which can be used to assess its suitability for the material to be compacted.
 - What method of compaction is to be used in the trial and whether or not it has been based upon the guidance from SHW Table 6/4.
 - Confirmation of the source of material to be used.
 - Confirmation that they understand the minimum specification requirements for end-performance of the fill which are to be assessed and demonstrated during the trial.
 - The methodology for assessing fill, including test type and frequency and who will be undertaking the testing both on site and for the subsequent laboratory analysis.

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- Confirmation that all parties who are to attend the trial have been informed of when and where the trial will be undertaken.

13.3.6 For each proposed compaction method, a number of test panels shall be constructed in order to allow a full assessment to be completed. Key criteria to identify during the compaction trial will be:

- Change in density and air voids against number of passes.
- Change in density and air voids against thickness of layer.
- Change in engineering performance against compactive effort.
- Identification of point of over-compaction/softening of fill.
- Comparative analysis between different plant.
- Suitability of material for use on site for the proposed end-use.
- Confirmation of classification and engineering performance of material, including sampling, laboratory testing and classification of the material.
- Comparison of actual performance of material against End Product requirements.
- Initial calibration of testing equipment, in particular where the use of a Nuclear Density Gauge [NDG] is proposed for the monitoring of earthworks operation.

Compaction of Test Panels

13.3.7 Earthmoving plant shall not be accepted as compaction equipment, nor the use of lighter compaction plant to provide any preliminary compaction prior to the use of heavier equipment.

13.3.8 Although the guidance from Table 6/4 of the SHW may indicate the optimum number of passes of the appropriate plant, it is important that the progression of improvement of the material is monitored throughout the compaction process. As such, after every two passes of the appropriate roller, in-situ assessment of the density of the material shall be undertaken. One pass of the roller is defined as a single movement of the compaction plant, in one direction, over a given strip of the test panel.

13.3.9 Where the width of the test panel or roller requires a number of passes in order to ensure the full width of the surface is compacted, it is acceptable for the roller to overlap the previous strip by a small margin [no more than 25% of the maximum roller width]. However the Contractor shall ensure that no in-situ testing is undertaken in this zone to prevent the effect of over-compaction influencing the assessment of the performance of the plant and material.

13.3.10 Compaction of the test panel shall continue incrementally until a clear indication has been obtained to show that the soil has either achieved a maximum density, i.e. where after a number of repeat passes is completed no change is identified or has been over compacted and the performance of the material begins to deteriorate.

13.3.11 The exception to this will be where the final performance of the test panel is required to be confirmed using plate load testing, and in this instance it is recommended that a separate panel is constructed, to the same specification as has been identified during the compaction trial, in order that the assessment of the performance can be completed without the detrimental

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influence of over-compacted material. Guidance on the point of over compaction may be readily identifiable on site from a number of key parameters:

- Reduction in bulk density/dry density with increasing compaction.
- Increase in moisture content, where the over-compaction of the material drives moisture up through the material to the surface [mobilisation of excess pore pressure]. This may also be observed during the passage of the roller, with material adhering to the roller, and/or the surface of the compacted layer beginning to tear.
- Reduction in engineering performance of the material with increasing compaction.
- Visible movement of the surface of the material during the passage of the compaction plant, typically exhibited as a 'bow wave' in front of the roller.

13.3.12 Identifying the point at which the materials become over-compacted is very important for a number of reasons. Should the material not be competent to undergo additional compaction and/or trafficking, then an engineering decision will be required by the Contractor prior to the commencement of the main earthworks program.

Assessment of Test Panels

13.3.13 The compaction trials shall be undertaken in such a way as to demonstrate what works are able to achieve the End Product criteria given in Appendix 6/1.

13.3.14 Initial characterisation of the material shall comprise: sets of testing (one from each layer) each comprising grading, Atterberg Limits laboratory compaction curves [OMC/MDD using the test appropriate to the material type as given in Appendix 6/1], particle density, field moisture content and laboratory permeability testing.

13.3.15 In-situ density (bulk and dry) measurement of the compacted material and moisture content shall comprise: on each layer and at each increment of two passes: six nuclear density gauge readings, evenly spaced in two rows at distances of 5m, 10m and 15m along the test layer. Refer to Appendix 1/5 with respect to the use of NDG equipment. Undrained Shear Strength using hand shear vane shall comprise: on each completed panel: one test per density test location. Refer to Appendix 1/5 regarding the use of Hand Shear Vane equipment.

13.3.16 A CBR value using conventional CBR testing apparatus shall be determined on each completed test panel to determine the materials suitability for use in the upper 2 layers of Engineered Fill. Tests shall be evenly spaced in a central row at distances of 5m, 10m and 15m along the test panel.

13.3.17 CBR using Plate Load Tests shall be completed after CBR testing outlined in 13.3.16 has indicated that a value of 3% has been achieved for a given number of passes. 1 Plate Load Test shall be undertaken per trial panel. The test is to be undertaken in the centre of the panel and in multiple cycles as defined in IAN 73/06.12.3.18. Table 6/3-1 summarises the minimum testing requirements to be undertaken for each trial panel.

13.3.18 Upon completion of the above a soakaway test shall be performed in the test panel materials so as to determine the infiltration rate. The base of the associated excavation shall such that not less than 500mm of trialled material is present below the test. Refer to Appendix 1/5 for further details for the test method.

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13.3.19 The Contractor shall provide a report describing the findings of the test panel. The proposed report format shall be presented to the Engineer 2 weeks in advance of any test panel tests for approval. The report shall include:

- Date and weather conditions, personnel recording the test panel findings.
- Description of the plant and method used (make, weight, model, roller size etc.).
- Description of material used in the test panel (source, tests result certificates, Class type).
- Photographic records of material used, plant used and examples of the as compacted condition.
- Certificates for insitu and laboratory tests undertaken on the compacted layers.
- Appraisal of test results, conclusions and description of the method proposed for the mainworks.

Table 6/3-1 Compaction Trial Testing Requirements

Test Property	Recommended Frequency of Testing
Bulk Samples before compaction	Per layer for MC, PI, PSD, OMC/MDD, particle density and laboratory permeability testing.
Bulk, Dry Density and Air Voids	6 tests per compaction increment per layer using NDG ¹ All such tests to include particle density and moisture content determinations hence derivation of air voids. % relative compaction to be determined relative to the MDD established for the layer.
Undrained shear strength ²	1 per NDG test using HSV
NDG Calibration ¹	As part of each compaction trial initial calibration of NDG equipment shall be undertaken for each instrument used. The calibration shall be undertaken in accordance with methods prescribed in BS1377 Part 9: 2.5 and to the satisfaction of the Engineer.
CBR (BS1377 Part 9 Section 4.3)	3 test per panel at the specified locations.
Plate Load Test to IAN 73/06	1 per completed trial panel, multiple cycles as defined in IAN 73/06
Soakaway Test (BRE 365)	1 set of tests per completed trial panel

1. subject to revision depending on soil type – refer to note 24 in Appendix 1/5.

2. Where fill is cohesive

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13.4 Placing and Compacting Fill

- 13.4.1 Cobbles, boulders, rocks or fragments whose largest dimension is greater than two-thirds of the compacted layer thickness shall not be incorporated into the Earthworks Material. Any softened cohesive materials encountered in stockpiles shall be removed and not incorporated into the fill. Potentially deleterious materials shall not be incorporated into the fill.
- 13.4.2 The contractor shall take all necessary steps to ensure that fills are placed at the moisture content/condition necessary to achieve the compaction specification and shall, where necessary, add water to or dry the fill, in order to obtain this value. Where it is necessary to add water, this shall be done as a fine spray and in such a way that there is time for the water to be absorbed into the fill before being rolled by the plant.
- 13.4.3 Compaction plant and compaction method shall be selected having regard to the proximity of existing trenches, excavations, retaining walls or other structures and all work shall be performed in such a way as to ensure that their stability is not impaired.
- 13.4.4 If the results of control tests indicate that the fill is being placed and compacted in such a way that the desired End Product is not being achieved, the Contractor shall further compact or, if necessary, shall excavate the affected work and replace with new fill, compacted to meet the specification requirements.

14.0 End Product Testing

- 14.1 The compliance of the compacted materials meeting the compaction specification shall be demonstrated by undertaking End Product testing as detailed in Appendix 1/5 and with reference to End Product requirements given in Table 6/1 of Appendix 6/1. Test locations shall be evenly distributed throughout the fill area at the frequency defined in Appendix 1/5. The Contractor shall agree test locations with the Engineer.
- 14.2 The Engineer shall be at liberty to request additional tests considered necessary to confirm that the End Product requirements are being met.
- 14.3 In the event of a test failure the Contractor shall provide a full comprehensive interpretation of the nature of the failure based on the test results and propose suitable remedial action. In the event of a test failure the Engineer shall be informed verbally immediately and (no later than 48 hours in writing), all work should cease in the associated area until a full comprehensive interpretation and solution has been found to rectify any such failure.
- 14.4 The relative dry density requirement shall be deemed to have been obtained provided that at least 90% MDD of tests attain the specified dry density, provided that no value falls below 93% MDD.
- 14.5 The air voids required shall be deemed to have been achieved if at least 90% of tests attain the specified air voids, provided that no remit value exceeds 10% air voids.
- 14.6 Placed and compacted cohesive soils are to be have an undrained shear strength of 50kN/m² using the testing methods described in Appendix 1/5.
- 14.7 With respect to permeability the end product requirements can be consider to be met provided all of the following requirements are satisfied (i) laboratory permeability tests undertaken in the compaction trial record permeability values of not more than 1x10⁻⁷ m/s and (ii) the

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requirements for relative density and air voids given above are met and (iii) the soakaway tests determine an infiltration rate of not more than 10^{-7} m/s.

- 14.8 CBR tests are to be undertaken on placed and compacted materials in the upper 2 layers of Engineered Fill. CBR tests shall be undertaken at the as placed moisture content at a rate of 1 per 35m x 35m grid per layer and are to demonstrate a CBR of 3%.
- 14.9 Plate load tests (min 300mm dia. plate) shall be carried out in accordance with IAN 73/06 on the completed Earthworks Formation Level to demonstrate a minimum CBR value of 3% at the as placed moisture content. Such testing is to be undertaken on a 70x70m grid, subject to modification to ensure that any marginal pass CBR determinations (arising from testing based Appendix 1/5 and Appendix 6/1) are tested.
- 14.10 The requirement for flux chamber tests and a surface emission mapping survey for ground gas assessment purposes is detailed in Appendix 6/12.
- 15.0 Additional Limitations of Deposition of Materials Referred to in 601.13, 601.14 and 601.17**
- 15.1 Cobbles having an equivalent diameter of more than 150mm shall not be deposited within 2m of the finished surface at any location.
- 16.0 Permissible Deviation**
- 16.1 Permissible deviation from formation levels +/- 50mm.
Permissible deviation from linear dimensions +/- 75mm.
- 16.2 In addition the requirements of Appendix 6/13 should be noted. In the event of conflict Appendix 6/13 takes precedence.
- 17.0 Restrictions on Battering of Excavations for Foundations and Trenches and Requirements for Benching**
- 17.1 No specific limitations or restrictions are included for the battering of excavations for foundations and , but the contractor shall be responsible for ensuring safe working practices. Battered excavations are to be benched prior to backfilling. Contractor to also note the specific requirements for batter where existing Made Ground is to receive fill as indicated on SK53
- Benching or shaping of earthworks slope faces to receive fill
- 17.2 Where existing embankments are to be extended and where fill is to be constructed on ground with a slope steeper than one in eight, benching of the existing slope shall be formed as per the SHW. Bench heights are to be a multiple of the relevant compaction layer thickness, with the maximum vertical height of each bench not exceeding 500mm.
- 17.3 Where, during the progress of the work, the difference in level between adjacent areas of filling exceeds 600mm, the Contractor shall cut into the edge of higher filling to form benches having a minimum width of 600mm and a height equivalent to the depth of a layer of compacted filling. The Contractor shall spread and compact new filling to ensure maximum continuity with the previous filling.
- 17.4 Where the Engineered Fill is to be placed against a batter comprising existing Made Ground (which is to be treated by preload/surcharge loading) the tie in will be based on a suitable benching arrangement which is described thus: the material is to be placed and compacted in a

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prepared benched excavation formed in the natural undisturbed clay. The height of the benches shall be as per the layer thickness required by the compaction method used but the height shall not exceed 250mm. The width of each bench shall be the greater (i) 3 x bench height, (ii) 1.0m or (iii) the width required to ensure adequate compaction by the plant used. Refer to 11950-SK53 for detail.

- 17.5 Fill material in areas of benching shall be carefully placed and compacted to ensure that no voids occur at the upright steps of the benching.
- 17.6 Placement and compaction of the fill material shall continue to the level of an adjacent bench before material is placed upon that bench.
- 17.7 Four additional passes of the roller shall be made on the area within two metres each side of the upright face immediately following the compaction of the first layer of fill material on each bench.

18.0 Excavation Supports to be Left in Place

- 18.1 No excavation supports are to be left in place.

19.0 Mixing of Excavated Materials

- 19.1 Mixing of acceptable and unacceptable excavated material is not permitted.

20.0 Fill to Excavated Voids.

- 20.1 Areas of inadequate strength shall be removed and backfilled and replaced with materials placed and compacted in accordance with this Specification.

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21.0 Deterioration of Fill Materials

- 21.1 If an authorised formation or material deposited as fill subsequently deteriorates due to inclement weather or water ingress (or for any other reason) such that, in the opinion of the Engineer, it would be reclassified as unacceptable and cannot be compacted in accordance with the Contract, the Contractor shall:
- i. Cease work on the material until its condition is such that it can again be classified as acceptable.
 - ii. Make good by removing and disposing of the unacceptable material and replacing it with acceptable material.
- 21.2 Where, in the opinion of the Engineer, earthworks have been adversely affected by the ingress of water during the earthworks contract so as to render the material unacceptable, these works shall be removed and made good at the Contractor's expense subject to test results proving the material to be unacceptable

22.0 Reporting

- 22.1 For each phase of works, the contractor shall prepare and present to the Engineer on weekly basis a report which provides the following
- § Volume of Fill Placed
 - § Per Test: quantity of test required by the specification based on this volume
 - § Per Test: quantity scheduled to date
 - § Per Test: quantity of results received to date
 - § Confirmation that all MCV or MC results are within the required range
 - § Per Test: quantity of results that do not comply with the specification
 - § An outline of corrective action in relation to any non-compliant results
 - § An indication if the corrective action has been completed or is pending (with dates).
 - § Confirmation that the corrective action has resolved the issue
 - § A spreadsheet based detailing the above and the test results, which is to be traceable between the test/sample location, layer, grid coordinate, a unique sample/ testing ID and the related test certificates.
- 22.2 On completion of earthworks in each development sub-phase (refer to 11950-SK107 for sub-phase areas), the Contractor will prepare a collated factual Validation Report and submit this to the Engineer. In addition to the items list below it shall also include information needed for completion of the geotechnical feedback report as defined in Design Manual for Roads and Bridges (BMRB) HD22/08 Managing Geotechnical Risk.
- The validation report is to include, but is noted limited to, the following:
- a) general description of the earthworks, excavations, placement and compaction methodology and plant used;
 - b) quantities of excavated, imported, re-used, treated and disposed materials;
 - c) details of remediation and treatment, including quantities, licence arrangements;
 - d) the extent of the excavation formation;
 - e) details and quantities of any grouting, sealing or similar of historical structures;
 - f) surveyed location of all remnant obstructions and week by week progress drawings;
 - g) detailed weather conditions;
 - h) formation treatment including ground improvement, drainage measures and treatment of soft areas or contamination;
 - i) data relating to the relevant compaction trial reports.

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- j) application of acceptability criteria and summary of the end product test results for each specific earthworks material placed during the earthworks operations;
- k) a copy of all test results including grid location and level;
- l) actions taken in relation to any test failures and the results of any testing associated with this;
- m) drawings showing the location of each specific earthworks material placed during the earthworks operations on a layer by layer basis, any feature or operation relevant to the earthworks including instrumentation and the location of the trial areas and control tests;
- n) drawings showing the location, extent and contours of all stockpiles formed from surplus site won soils;
- o) an electronic copy of all the test results and monitoring associated with the earthworks operations, including chemical validation results and including those associated with surplus soil stockpiles;
- p) environmental and groundwater monitoring results;
- q) additional requirements of the Local Authority and Environment Agency;
- r) Contamination relevant records including:
 - Description of U1B / U2 material actions
 - Description of residual contamination
 - Volumes of Materials Treated, Disposed of, Imported and Stockpiled (Soil and Water)
 - Description of Waste Management: Quantities, Classification, Licensing and Documentation
 - Formation Inspection
 - Remnant Obstructions
 - QP Declaration for MMP
 - All records required for the MMP validation report
 - Details of Regulatory Liaison and Discussions
 - Waste Records (including classification and Duty of Care)
 - Laboratory analytical results.
 - Photographs

22.2 The Contractor shall make provision for the production of three such validation reports to enable phased delivery of the site.

23.0 Other survey Requirements

23.1 Before starting work the Contractor shall complete a visual survey and update the topographical survey of the site and submit the survey report to the Engineer.

23.2 During works the Contractor shall survey the extents of excavation, retained features (such as obstructions) and underground services (if encountered) prior to backfilling.

23.3a For each development sub-phase the Contractor shall provide a survey of: the full extent of the Excavation Formation Level including any side batters; location of former subterranean structures removed; drainage routes; extent and level of each layer of compacted earthworks layer placed (see below); the Finished Earthworks Level and extent of Engineered Fill; and the extent of surcharge load. All retained exploratory locations and supplementary investigation points shall also be surveyed and included.

23.3b Subject to the prior written agreement of the Engineer and the presentation of an agreed Method Statement, the contractor shall be permitted to omit the survey of each Engineered Fill layer placed on the provision that all the associated earthworks plant is demonstrated to have a working GPS layer control in addition to other earthworks controls on level thickness. The

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

contractor shall still maintain a layer control system such that each layer can be individually identified and sample locations still surveyed (along with other survey requirements noted above/elsewhere). If in the opinion of the Engineer layer control is not being achieved the Contractor shall be required to implement the survey of each layer.

- 23.4 For each development sub-phase on completion of the bulk earthworks and the surcharge loading treatment (as discussed in Appendix 6/13 and including any making good of levels and re-making up to final site level), an as built survey, including level data of the completed works shall be undertaken by the Contractor. All level survey information and an assessment of volumes of excavated, remediated and surplus soil shall be provided to the Engineer. The final 'as built' topographic survey shall include details of the earthworks placement areas, reduced level areas and remaining stockpiles.
- 23.5 Upon request by the Engineer the contractor shall provide cross sections through the works so as to demonstrate (i) the excavation formation level (ii) layer thicknesses and (iii) extent of engineered fill (so as to facilitate construction of any tie in arrangements) and (iv) any side batters. The cross sections are to be geo-referenced, provide level information to Ordnance Datum Newlyn, provided with chainage and produced to scale. The vertical scale may be exaggerated to as to illustrate key features. Any such section are to accompanied with plan showing the extent and orientation of the cross-section along with the chainage. The such plans are to be to scale and to be related to the National Grid coordinate system.
- 23.6 Survey works shall ensure that the reporting requirements given above can be met along with any other survey requirements given in this specification.
- 23.7 All levels shall be related to Ordnance Datum Newlyn and surveys shall be based on the national grid coordinate system and shall be considered with the updated topographical survey.
- 23.8 The maximum error between permanent survey control stations shall not exceed 1:20,000.
- 23.9 A drawing shall indicate each permanent survey control station showing its general location with dimensions to at least three easily recognisable and durable points.
- 23.10 The maximum distance between adjacent spot levels shall not exceed 15 metres. Ground survey spot levels on hard surfaces shall be correct to +/- 10mm r.m.s.e. and elsewhere to +/- 25mm r.m.s.e. Accuracy for linear dimensions is to be +/- 25mm. The drawing shall be supplied in 3D AUTOCAD.DWG format, at a scale of 1:200 on CD ROM. It shall be kept up to date on at least a weekly basis with respect to ground excavations and be made available to the Engineer on request.

24.0 Tie in Of Engineered Fill with Surrounding Ground

- 24.1 As part of the excavation works for each development phase as built plans for the surrounding phases area (as provided by the relevant contractor) will be referred to by contractor who will locate any Engineered Fill placed as part of the previous work. The placement and compaction of Engineered Fill as of the current Phase works shall be undertaken by the contractor so as to tie into the any previously placed Engineered Fill. The nature of this tie in detail will be in accordance with Drawing SK 151. Likewise Engineered Fill is to tie in to the Weald Clay
- 24.2 Fill material in areas of benching shall be carefully placed and compacted to ensure that no voids occur at the upright steps of the benching.
- 24.3 Placement and compaction of the fill material shall continue to the level of the adjacent bench before material is placed upon that bench.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

- 24.4 Four additional passes of the roller shall be made on the area within two metres each side of the upright face immediately following the compaction of the first layer of fill material on each bench.

APPENDIX 6/8: TOPSOIL

APPENDIX 6/8: TOPSOIL

APPENDIX 6/8: TOPSOIL

Strip topsoil and stockpile. Stockpiles of topsoil and pseudo-topsoil shall be formed in accordance with guidance provided by DEFRA '*Construction code of Practice for the Sustainable Use of Soils on Construction Sites (2009)*'.

APPENDIX 6/12: INSTRUMENTATION AND MONTORING

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

Refer to Appendix 6/13 for instrumentation and monitoring associated with the ground treatment works.

Refer to the CEMP for environmental monitoring requirements

1.0 Post Earthworks Gas Monitoring

- 1.1 In order to inform the requirement for gas protection measures in the proposed development gas monitoring will be required. Locations are shown on the Instrumentation and Monitoring drawings.
- 1.2 Installations will be carried out via Dynamic Continuous Sampler (DCS) at the locations indicated on drawings. Two holes will be required at those locations where different depths and/or strata require monitoring (as detailed below). The response zones shall be isolated into one material only and single locations with dual installations shall not be carried out. The following criteria shall be followed:
- a) Locations in the Surcharge Area - two installations required. The shallow well shall be progressed through the surcharge, where present, and extend 1m into the underlying Engineered Fill with a 0.5m response zone at the base. The holes shall be sealed with bentonite above the response zone to the surface. The deeper well shall be sealed with bentonite all the way through the clay cap and the response zone shall be 3m long in the underlying fill material (not to extend into the Weald Clay, if encountered).
 - b) Locations outside the Surcharge Area and over Engineered Fill which is deeper than 2.5m - two installations required at those locations where Engineered Fill exceeds 2.5m depth. The shallow well shall be 1m deep overall with a 0.5m response zone at the base. The deeper wells, where installed, shall be sealed with bentonite to 2m below ground level. The response zone will extend to the base of the Engineered Fill or be 3m in length, whichever is the shallower.
 - c) Locations outside the Surcharge Area and over Engineered Fill which is less than 2.5m depth, or over natural clay (i.e. no fill materials present) - the well shall be 1m deep overall with a 0.5m response zone at the base.
- 1.3 The works shall be progressively carried out as phases are completed across the site.
- 1.4 The works shall be carried out in accordance with BS 8576: 2013 and the UK Specification for Ground Investigation, 2nd Edition, published by Thomas Telford Ltd 2012 with the following amendment to Clause 12.4.1:
- 1. The following parameters shall be monitored and recorded on each visit to the site. Items iv to viii shall proceed in the order stated and the gas tap shall be closed between the flow and gas concentration stages.
 - i) Weather conditions on the day of and 24 hours prior to the visit.
 - ii) Air temperature.
 - iii) Barometric Pressure on day of visit and preceding 3 days.
 - iv) Downhole temperature.
 - v) Downhole pressure and the flow rate should be recorded every minute over a 10 minute period.
 - vi) Concentrations (% vol) of CH₄, CO₂ and O₂ (ppm) over a 10 minute period with concentrations recorded every minute.
 - vii) Water level

If water is encountered the Engineer may instruct removal.

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

Engineer approval shall be obtained prior to commencement of any laboratory analysis.

The Engineer may instruct that prolonged pumping gas monitoring is undertaken over a period of up to 2 hours on selected wells.

2. Monitoring on-site shall generally be undertaken using portable handheld equipment. The performance specification and accuracy of the equipment employed shall meet the requirements of Table 2 in BS8576: 2013 and be stated in the final report.

3. Any damage to the monitoring installation or incidents of open gas taps upon arrival shall be recorded.

4. The name of the person monitoring shall be stated and wherever possible the same person shall be used on each monitoring visit to maximise consistency. Monitoring visits shall be coordinated so as to include 'worst case' events comprising periods of rapidly falling barometric pressure.

- 1.5 Before construction of each ground gas standpipe the Engineer shall be contacted to agree installation details.
- 1.6 Bulk bag soil samples shall be taken in order to accommodate Forensic TOC analysis that may be scheduled. For the shallow installations one representative samples shall be taken of the Engineered Fill (all sampled soils will be placed into a large bulk bag throughout the full depth of the fill); and for the deeper installations one representative samples shall be taken of the unclassified fill (all sampled soils will be placed into a large bulk bag throughout the full depth of the fill).
- 1.7 The temperature of the soil shall be recorded every 1m on removal of the borehole tool.
- 1.8 Soil descriptions and logs are required in accordance with BS 5930:2015.
- 1.9 Raised covers will be provided and these will be protected via concrete drainage rings or similar (e.g. 0.5m depth, 2m diameter)
- 1.10 Monitoring for flammable gases via Flame Ionisation Detector (FID) is required at 1m intervals during formation of each borehole. Results to be provided on the respective logs.
- 1.11 Provision shall be made for 3 months monitoring at *weekly intervals* on the surcharged areas of the site. Monitoring may be curtailed in areas where initial monitoring results are within acceptable parameters but this will require agreement with the Regulator. Three monitoring visits should be required in total in the single installation DCS 1102 in the non surcharge area which has been subject to a cut and fill treatment.
- 1.12 Groundwater samples shall be obtained for each installation on the first 2 sequential visits and the samples tested for pH, conductivity, ammonia, dissolved oxygen, dissolved carbon dioxide and SO₄. Samples shall be obtained using low flow sampling methods.
- 1.13 Data shall be provided in excel, pdf and AGS 3.1 in full incorporating both the main phase of fieldwork and all subsequent gas and water monitoring visits and iterative phases of chemical analysis. The data shall be checked by the Contractor prior to issue and be accompanied by the error log.
- 1.14 In order to prevent the creation of gas migration pathways and to prevent water ingress all installations will be decommissioned upon completion of the monitoring (as agreed with the

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

regulatory authorities) in accordance with EA guidance (Decommissioning Redundant Boreholes and Wells).

2.0 Large Scale Gas Generation Field Tests (Drum Tests)

2.1 Drum Tests shall be undertaken as per the frequency provided in Appendix 1/5 on the following classes of soils: 1A – 1C and 2A – 2D.

2.2 Scope

2.2.1 This document specifies test methods for assessing the gas generation potential of fill materials used below developments.

2.2.2 This is intended as a test from which the risk associated with ground gas generation from fill materials below developments can be assessed following guidance in documents such as the Local Authority Guide to Ground Gas (CIEH, 2007).

2.2.3 This test provides a measure of the potential amount of biogas (methane and carbon dioxide) that might be released if it is placed in the ground. It is a large scale test that is intended to replicate the actual ground conditions in a site. As such it is not artificially seeded with an inoculum of methanogenic bacteria and any gas generated is the result of bacteria present in the fill already.

2.3 Terms and definitions

2.3.1 For the purposes of this document the following terms and definitions apply.

Biogas – methane and carbon dioxide.

Aerobic – Soil atmosphere that is rich in oxygen.

Anaerobic – Soil atmosphere that does not contain oxygen.

Biodegradation - chemical dissolution of materials by bacteria, fungi or other biological means.

2.4 Principle

2.4.1 When fill material is placed in the ground it will initially be in an aerobic environment as oxygen is trapped in the material. Aerobic degradation of any degradable organic matter occurs and uses up the oxygen. Once anaerobic conditions are established methanogenic bacteria continue to degrade the organic material that is available for degradation until it is used up and gas production ceases.

2.4.2 A representative sample of fill material and groundwater from a site is placed in a sealed steel drum. A sealable gas tap is fitted to the top of the drum to allow gas monitoring from the headspace above the sample. The concentration of methane and carbon dioxide in the headspace of the drum is recorded at set intervals over a period from 20 days to 100+ days.

The temperature during the test is recorded (but is not maintained at a set value). The ambient temperature during the tests must not drop below 10°C (in winter the tests will need to be housed indoors and appropriate safety precautions taken).

2.4.3 The results are reported as litres of biogas per kg of fill material.

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

2.5 **Equipment**

Biodegradation test vessels – a series of steel drums of height 0.85m and diameter 0.57m. This gives 0.22m³ internal volume with an air tight lid and a sealable gas tap. (other dimensions to be agreed with the Engineer)

Balance – capable of weighing mass of sample to +/- 1%

Thermometer – capable of measuring air temperature to +/- 0.5°C

Gas monitor – Meeting the requirements of BS8576: 2013, Guidance on investigations for ground gas – permanent gases and volatile organic compounds (VOCs). Clause 9.3 and Table 2. The sample pump rate should be stated.

2.6 **Sample Size**

2.6.1 The sample should be sufficient to fill a 0.22m³ drum and leave a 100mm deep headspace at the top of the drum when loosely compacted down in the drum. The weight of the sample should be recorded.

2.7 **Procedure****Filling**

2.7.1 A steel drum is filled with the material to be tested.

2.7.2 The materials shall be loosely compacted into the steel drum to remove all large voids and leaving a 0.1m depth of headspace (this equates to 0.025 m³ headspace volume). The mass of each material used to fill the barrels should be measured using a balance to determine the approximate wet bulk density of the material within each barrel. The moisture content of the materials placed into the barrels will be measured using either a theta probe or by sending samples to a laboratory.

2.7.3 Groundwater from the site should be used to fill the barrels with at least 20 litres of water (to the top of the soil).

2.7.4 Following emplacement of the materials into the barrels and filling with water, the barrel lids should be secured and sealed using a volatile organic compound (VOC) free sealant. A small hole (0.5mm diameter) should be drilled into the top of the barrel lid for insertion of a gas tap. The gas tap should be sealed into the barrel lid using a VOC free sealant. Filling of the drum and sealing and securing of the gas tap should be carried out on the same day.

2.7.5 Filled barrels should be located in a safe location agreed with site staff where there is no need for disturbance of the barrels during the test period. The ambient temperature during the tests should not fall below 10°C for any significant period of time and therefore a heated container shall be provided, if required, to ensure temperature does not fall below 10°C.

Biogas measurement

2.7.6 Following filling of the barrels on day zero, measurements of ground gas concentrations should be made twice per week at three day intervals (e.g. Monday and Thursday) over a period of 100 days. Each measurement event shall last for exactly 5 minutes (if this is amended then the time shall be recorded but amendments must be avoided where at all possible). Concentrations of ground gases will be recorded each minute over the 5 minute period. The tests may be extended up to a total period beyond 100 days if required. The date of the first test should be recorded as T1 and dated, the second as T2 and dated, and so on.

APPENDIX 6/12: INSTRUMENTATION AND MONITORING

- 2.7.7 Concentrations of ground gases will be measured using the gas monitor. Gases measured should be methane (CH₄), carbon dioxide (CO₂), oxygen (O₂), carbon monoxide (CO) and hydrogen sulphide (H₂S). Flow measurements are not required but the differential (may be referred to as borehole pressure on some gas monitors) is required. The temperature of the barrels should be recorded during each measurement event.
- 2.7.8 To measure the temperature of the soils within the drum one thermometer/thermocouple should be attached to the side of each of the drums and protected as necessary. The bulb/thermocouple wire leg junction should be thermally protected from the elements using insulation spay foam or similar.

Reporting for Drum Tests and Gas Monitoring

- 2.7.9 The test report should provide the following:
1. Date of test
 2. Description of material tested and source
 3. Cumulative record of biogas concentration and number of sampling events.
 4. Temperature record over period of test
- 2.7.10 The test results shall be provided in an excel spreadsheet that is updated each time measurements are taken. The results should be provided in tabular form in the spreadsheet in a layout that is agreed with the Engineer.
- 2.7.11 The results of each weekly monitoring round will be forwarded to the Engineer on completion.
- 2.7.12 The Drum Test is for information and assessment purposes and the results will be used to inform remedial and re-use decisions.

3.0 Flux Chamber Tests

Flux chamber tests shall be undertaken to measure methane emissions, as shown on Instrumentation and Monitoring drawings. For the Surcharged Area the tests will be carried out over the surface of the excavated formation layer, including over dig, and prior to installation of Engineered Fill. If the results indicate a potential gas risk then the monitoring shall be repeated on completion of the installation of the engineered fill and prior to the installation of the surcharge. For non surcharged areas they shall be carried out across the finished formation layer. The flux chamber tests shall be undertaken in accordance with the guidance in the Environment Agency LFGTN 07, Guidance on monitoring landfill gas surface emissions. The location of the tests shall be agreed with the Engineer in advance. A method statement for the works shall be agreed with the Engineer for prior approval. If the Contractor is not able to carry out the works then the work shall be sub contracted, at no additional cost to the client, to a suitable specialist who must be approved by the Engineer prior to appointment.

4.0 Surface Emission Tests

- 4.1 A surface emission mapping survey shall be carried out to measure methane emissions.
- 4.2 For Surcharged Areas the survey shall be carried out over a 5m grid (i.e. on a series of traverse lines spaced at 5.0m centres). The survey will be carried out over the surface of the excavated formation layer, including over dig, and prior to installation of Engineered Fill. If the results indicate a potential gas risk then the monitoring shall be repeated on completion of the installation of the engineered fill and prior to the installation of the surcharge.

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- 4.3 For non surcharged areas the survey shall be conducted on a 25m grid across the finished formation layer
- 4.4 All measurements shall be taken at 10mm above ground level with a laser diode methane detector calibrated to detect methane and with a detection threshold of 1 ppm. The instrument shall have a response time less than 5 seconds. Readings shall be taken every 3 seconds and shall be time stamped with the time and GPS location.
- 4.5 The survey work shall be carried out by an experienced and competent technician who has undertaken similar work for compliance testing on licensed landfill sites. A method statement for the works will be submitted to the Engineer for prior approval. If the Contractor is not able to carry out the works then the work shall be sub contracted to a suitable specialist who must be approved by The Engineer prior to appointment. The results shall be reported as a table of results alongside a contour plot of the emissions recorded. The wind speed/direction, temperature, atmospheric pressure and rainfall on the site at the time of the survey shall be recorded.

5.0 Validation Trial Pits in Surcharged Area

- 5.1 At the excavation formation level and prior to construction of the Engineered Fill, trial pits shall be excavated to 4m below excavation formation level across landfilled areas on an approximate 50m grid and/or where elevated TOC concentrations and/or elevated methane concentrations were detected. The locations are shown on the Instrumentation and Monitoring drawings. The purpose of these is to inspect for both gaseous material and soft / organic material that could present an ground settlement issue. The trial pits will require inspection by the Engineer and therefore the Contractor will provide 5 days' notice of the works. All trial pits shall be surveyed in accordance with this specification (one survey point per trial pit location is sufficient).

Gas Related Pits

- 5.2 Composite samples of representative soils from the excavated soils shall be taken for one Forensic TOC and one Drum Test per trial pit.
- 5.3 If Forensic TOC analysis and/or assessments associated with the Drum Tests indicate Unacceptable Material then these may require excavation as part of a hot spot exercise and the soil will be stockpiled for further assessment. The Contractor shall therefore allow time in the programme for results to be returned and assessed to accommodate this potential outcome.

Geotechnical Trial Pits

- 5.4 Where shown on drawings, trial pits shall be excavated to 4m below excavation formation level in areas where the ground investigation identified potentially compressible material beneath the excavation formation level. The pits are required to determine whether the zones represent significant soft spots that require excavation and replacement with Engineered Fill.
- 5.6 Subject to the Engineers instruction the Contractor shall excavate any soft or highly degradable materials and replace with Engineered Fill.

APPENDIX 6/13: GROUND IMPROVEMENT

APPENDIX 6/13: GROUND IMPROVEMENT

1.0 Geotechnical Improvement by Placement of Engineered Fill and Preloading by Surcharge**1.1 General**

- 1.1.1 Geotechnical improvement will not be required where the excavation formation reveals the presence of undisturbed natural strata comprising firm clay or medium dense sand or better. Geotechnical improvement will be required in areas where Made Ground is encountered at Excavation Formation Level. The purpose of the ground treatment is to ensure that the resultant works meet with the 'Performance Criteria' agreed with the Client (the performance criteria agreed with the client comprise total post construction settlements of not more than 75mm a differential movement of not more than 1/100, a permeability of not more than 10^{-7} m/s and a CBR value of 3% as the final and penultimate layers.
- 1.1.2 To ensure that the post treatment load-settlement characteristics of the treated materials are within the performance criteria mentioned above, geotechnical improvement is to be undertaken by forming: (i) pre-loading and surcharge loading of the pre-existing Made Ground; (2) the placement and compaction of fill materials to End Product criteria, as outlined below, totalling a 2m minimum thickness.
- 1.1.3 This fill is to placed and compacted so as to form an Engineer Fill. The Engineered Fill is to have the following properties: (i) a permeability of less than 10^{-7} m/sec (ii) an and air voids content of not more than 5% (increasing to not more than 10% where below 2m below proposed Finished Earthworks Level); (ii) relative density of not less than 95% Maximum Dry Density based on the appropriate compaction test for the material type (see Appendix 6/1); and (iv) a CBR value of not less than 3% at as placed moisture content in the upper 2 layers.
- 1.1.4 The earthworks operations undertaken to form the Engineered Fill outlined above shall be informed by compaction trials as detailed in Appendix 6/3. The compaction trials shall be witnessed by the Engineer. The Engineer will also witness the construction of installations and monitoring devices associated with the geotechnical improvement works.
- 1.1.5 The works shall be undertaken in the sequence stated in Appendix 6/3.
- 1.1.6 All earthworks and associated compliance testing shall be carried out in accordance with Appendix 6/3. The placement and compaction of the Engineered Fill will be monitored full time by the Engineer.
- 1.1.7 If unforeseen ground conditions or unforeseen responses to the treatment are encountered then the Engineer shall be notified immediately.
- 1.1.8 In the event of a test failure the Contractor shall provide a full comprehensive interpretation of the nature of the failure based on the test results and propose suitable remedial action. In the event of a test failure the Engineer shall be verbally informed immediately (and no later than 48 hours in writing), all work should cease in the associated area until a full comprehensive interpretation and solution has been found to rectify any such failure.
- 1.1.9 Prior to the commencement of the construction of the surcharge embankment the Contractor shall confirm their proposed sequence and phasing of embankment construction: this shall indicate the location and phasing of each discrete embankment location. Where not otherwise detailed the Contractor shall construct each sequential surcharge embankment with a full height 5m overlap with the previous embankment when these are sequentially constructed.

APPENDIX 6/13: GROUND IMPROVEMENT

1.2 Formation of Engineered Fill

1.2.1 The formation of the fills is detailed in Appendix 6/3.

1.3 Surcharge Construction

1.3.1 The lower 250mm of surcharge material shall be constructed from compacted Engineered Fill placed and compacted in accordance with the Appendix 6/3. Upon placement and compaction this upper surface of this 250mm Engineered Fill shall be surveyed. Other materials are then to be placed as discussed below.

1.3.2 The surcharge fills are to be placed to levels and over areas indicated on the Drawings and Sections provided by the Engineer.

1.3.3 No surcharge materials shall be placed closer than 10m to any existing structures, services or road pavements that are to be retained or that are off site.

1.3.4 Above the basal 250mm of Engineered Fill outlined above, the surcharge material is to comprise either Class 1 or Class 2 materials, as defined in the Specification for Highway Works (SHW) or, subject to the approval of the Engineer, (iii) Class 5 material as defined in the SHW. A minimum of 2 weeks shall be allowed for the Engineer to approve Class 5 material after the Contractor has presented supporting information. The surcharge materials shall be placed and compacted in layers not more than 500mm thick and, to confirm the bulk density of such surcharge materials, insitu density tests are to be undertaken at a frequency of 2 per 2000m³ for each 1m of lift, the test depth for these shall be 300mm below the then current surface of the works. Compaction shall be undertaken using the same plant and number of passes as used for compaction of each material type used in forming the Engineered Fill (i.e. same compactive effort as used for each layer of the Engineered Fill but layer thickness will be greater for the surcharge fill). Alternatively, the surcharge can be constructed from Engineered Fill as detailed in Appendix 6/3. In either case, the bulk density information is to be provided to the Engineer who may instruct alterations to the surcharge height so as to ensure an adequate surcharge pressure.

1.3.5 The edges of the surcharge are to be formed at slopes of 1 in 3 unless otherwise agreed by the Engineer.

1.3.6 The contractor is responsible for controlling the rate of construction so as to prevent temporary slope failure due to the temporary increase in pore pressure arising from the earthworks. The contractor is to use the piezometers proposed on drawings and is to install any additional piezometers as he may require so as to ensure adequate control of the works. Considering his governing criteria for the control the works vs. piezometric level along with associated calculations. The contractor shall employ a suitably qualified temporary works designer to provide this based on established soil mechanics theory and to be referenced accordingly.

1.3.7 The surcharge shall be trimmed to falls to shed rain water and the surface sealed to limit infiltration. The Contractor shall provide temporary drainage at the base of the surcharge to collect run off and to carry any surface water away from the base of the surcharge.

1.3.8 The full extent of the surcharge and its side slopes shall be surveyed upon completion.

1.3.9 Each surcharge treatment zone is to be left insitu for the minimum duration shown on plans after completion of construction to enable the amount and rate of settlement to be monitored and hence establish that 90% of primary consolidation has been achieved and any residual

APPENDIX 6/13: GROUND IMPROVEMENT

settlement is approximately linear when plotted against log time. The duration can be altered by the Engineer depending on the findings of the monitoring data.

- 1.3.10 If 90% consolidation and/or linear settlement vs. log time has not been established at the end of the period shown on drawings, the Engineer will instruct: (i) additional time for surcharging; (ii) increased surcharge loading; or (iii) acceptance of the anticipated further settlement. Conversely if these criteria are achieved sooner this period may be shortened by the Engineer and it should be recognised therefore the early provision of specified data could provide the Engineer the option to reduce the surcharge programme.
- 1.3.11 If the surcharge is constructed as a number discrete panels there is to be a 5m overlap of each individual panel constructed i.e. surcharge panels shall be constructed such that the embankment (at its full height) extends 5m beyond the shoulder of any previous placed surcharge embankment.
- 1.3.12 Following completion of treatment work, panel load tests may be required by the Engineer. Test panels will comprise earth mounds 13m x 13m x 2m high with additional side slopes constructed at 1:3. A settlement plate will be installed centrally beneath the base of the panel to the Engineer's requirements.

1.4 Permanent Datum

- 1.4.1 Two permanent datum's are required to provide a reference for the measurement of ground levels and instrumentation and to provide crosschecks with one another. The datum's are to be fixed into deeper, competent ground and isolated from any soft or compressible strata or strata subject to shrink-swell movements. These datum's are to be as per Fig 6 of BRE Digest 386 'Monitoring Building and Ground Movement by Precise Levelling', are to be at least 25m from existing or recently removed trees and to be secured at a minimum depth of 6m. The datum's shall be fenced off with a fence comprising at least three wooden stakes, 75mm square, preserved in accordance with BS8417, firmly bedded in the ground and stoutly cross-braced and projecting at least 1m above ground level. The woodwork is to be brightly painted.
- 1.4.2 The Contractor shall agree the locations of the permanent datum's with the Engineer 2 weeks ahead of their installation. It may be permissible to utilise datums from previous phases of work, subject to discussion with the Engineer, in which case agreement must be sought two weeks prior to commencement of earthworks or the installation of instruments, whichever is the earliest. The datums are to be located so as to minimise risk of damage from the proposed works, with due regard to any constraints as advised by the client and in areas where the contractor can be sure of security throughout the duration of the monitoring period. The installation of permanent datum's shall be completed prior to the installation of instruments and the commencement of earthworks
- 1.4.3 The level of the permanent datum's shall be established by the levelling techniques with reference to agreed benchmarks or survey stations in the vicinity. Levelling shall be closed back to the benchmarks to check accuracy.
- 1.4.4 The level value and co-ordinate position shall be measured three times soon after installation of the datum's and shall be checked at intervals to be established by the Engineer.
- 1.4.5 The following data shall be recorded for the permanent datum's:
- § Reduced level of datum (m OD)
 - § Plan position (National Grid Co-ordinates)

APPENDIX 6/13: GROUND IMPROVEMENT

1.5 Treatment Monitoring

- 1.5.1 Installation of instruments will be required prior to and after surcharge construction in order to monitor key parameters during the placement of the fill and the subsequent monitoring period. Rod settlement gauges shall be constructed at an approximate grid spacing of 40m. The RSGs and piezometers are to be installed at positions and levels indicated on drawings.
- 1.5.2 The Contractor shall be responsible for following the manufacturers' instructions and the requirements of this specification in the installation, calibration and testing of all measuring instruments and equipment, which shall be carried out in the presence of the Engineer.
- 1.5.3 The Contractor shall inform the Engineer at least 10 working days prior to undertaking the installation of the equipment. The Contractor shall make due allowances in his construction programme for delays which may arise on account of the installation of the instruments and of their maintenance.
- 1.5.4 The Contractor shall provide a geotechnical engineer or engineering geologist, as approved by the Engineer, experienced in the installation of geotechnical instrumentation for full time supervision of the drilling of boreholes and installation of the instrumentation equipment. The Contractor shall instruct a member of his engineering staff in the use of the equipment.
- 1.5.5 Boreholes for instruments are to be formed by an AGS accredited ground investigation sub-contractor in accordance with the UK Specification for Ground Investigation (Second Edition). They may be drilled by any method provided that it results in a clean and stable hole of the required diameter to the correct depth. Boreholes shall be cased to their full depth unless strata are sufficiently competent for the hole to stay open. Drilling mud or polymer additives shall only be used with the prior approval of the Engineer. The Engineer is to be given 2 weeks notice if mud or polymers are proposed. In the case of piezometer installation, drilling mud or polymer additives shall not be permitted.
- 1.5.6 During drilling, care shall be taken to ensure that the minimum material is lost from outside the casing. Surging casing shall not be allowed and flushing of drilling water up the outside of the casing shall be minimised.
- 1.5.7 The method of borehole formation, including the procedure for advancing casing, shall be submitted to the Engineer for approval 2 weeks before the commencement of the works. The works shall not commence until such time as the Engineer has approved the proposals.
- 1.5.8 A small disturbed sample and a bulk disturbed sample shall be taken during drilling of the boreholes at 1.0m centres and at every change in stratum. SPTs are to be performed at 1m intervals. If an SPT test is undertaken at the base of a borehole, it shall be ensured that the borehole extends at least 200mm beyond the base of the SPT test and cleaned out. A geotechnical log shall be produced in accordance with BS5930:2015 from the samples and borehole records submitted to the Engineer one working day after drilling has been completed at that location.
- 1.5.9 For all instruments placed in boreholes, grouting is required for part or all of the borehole during installation. The grout shall be a bentonite: cement mixture with sufficient water to achieve a pumpable mix. For piezometers it shall be ensured that grout placement does not affect the response zone.
- 1.5.10 Grout shall be poured or pumped into boreholes using a tremie pipe.

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- 1.5.11 All instruments shall be labelled with their reference number at the location where readings or measurements are to be taken. The labelling shall be permanent using a method or material to be agreed with the Engineer.
- 1.5.12 The Contractor shall provide suitably qualified and competent staff to take readings of instruments during construction and provide measurements/data at the time the instruments are read. The Contractor shall submit names and evidence of competence of personnel to carry out the instrumentation installation and commissioning for the approval of the Engineer before the commencement of the Works.
- 1.5.13 All records produced for the instrumentation must include the following data:
- § Project name
 - § Contract name and number
 - § Instrument reference number and type
 - § Dates of installation, reading or summary
 - § Times of installation or reading
 - § National Grid co-ordinates
 - § Personnel responsible for undertaking the monitoring
 - § Any relevant comments or remarks
- 1.5.14 The Contractor shall prepare an installation record sheet for each instrument installed. The format of the sheet shall be prepared by the Contractor and submitted to the Engineer for approval at least one week before installation commences. The record sheet shall include the following information in addition to the general information required:
- § Existing ground level at the time of installation
 - § Location in plan and elevation – Planned and 'As Built'
 - § Orientation – Planned and 'As Built'
 - § Lengths, widths, diameters, depth and volumes of backfill – Planned and 'As Built'
 - § Equipment used, including diameter and depth of any drill casing used
 - § Spaces for necessary measurements or readings required during installation to ensure that all previous steps have been followed correctly, including acceptance tests
 - § A simplified log of ground conditions (obtained during each boring)
 - § Type of backfill used
 - § Weather conditions
 - Space for notes, including problems encountered, delays, unusual features of the installation and any events that may have a bearing on instrument behaviour
 - § record of commissioning information and readings
 - § Any colour coding used
- 1.5.15 The Contractor shall submit to the Engineer a copy of each installation report sheet within one working day of completion of the installation, including taking of base readings.
- 1.5.16 The Contractor shall maintain the instrumentation in working order throughout the Contract or until the Engineer informs him that monitoring is no longer required. The Contractor shall ensure that the frequency of monitoring is adequate and in compliance with all requirements for control of construction and associated monitoring of constructions, as detailed on the Drawings.

Settlement Gauges

- 1.5.17 Steel plate settlement gauges (300mm square) shall be placed at excavation formation level. Monitoring of these and analysis of the data obtained should enable determination as to when the rate of settlement has suitably reduced and therefore when the surcharge can be removed.

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- 1.5.18 The plates shall have a welded $\frac{3}{4}$ " BSPF socket and are to be connected to reference rods which will extend through the surcharge materials. The steel rods are to be in 1m lengths and to have a 25mm OD with a $\frac{3}{4}$ " BSPF thread and external socket. The settlement gauge base plate and first length of rod shall be placed as early as possible during the earthworks, i.e. before any filling has taken place in the vicinity of the settlement gauge location. Extension lengths shall be installed when the level of the surrounding materials has been brought up to 250mm below the top of the preceding length. Levels shall be taken of the top of the rod and the surcharge fill adjacent to the gauge (i.e. outside the manhole ring) on each occasion. When rods are extended, levels (including the level of the base plate upon addition of the 1st rod) shall be measured immediately before and immediately after adding the extension. Good levelling practice should be observed.
- 1.5.19 Protective tubes will be placed around the reference rods as the surcharge are placed. These are to have an internal diameter of 52mm. In addition manhole rings shall be placed around the settlement gauges and associated rods, which are to be brought up progressively with the formation of the surcharge. Between the manhole ring and the protective tube, Class 6L (sand) shall be evenly placed. This is also to be brought up at the same rate as the construction of the surcharge. Care will be taken so as to prevent the sand from entering the protective tube.
- 1.5.20 Any fill placed around a settlement gauge should be placed in a 5m x 5m area using small manoeuvrable suitably sized compaction plant to avoid the risk of disturbance to the monitoring rod. The fill should be placed in layers of a thickness appropriate to the materials and compaction plant used. A method statement shall be provided by the contractor for approval by Engineer 2 weeks prior to the works.
- 1.5.21 The following data shall be recorded for the settlement gauges and similar settlement monitoring equipment:
- § Original ground level at the gauge location (m OD)
 - § Reduced level of the top of the rod (m OD) and length of rod(s) from this level to base plate (m)
 - § The reduced level of the base plate (mOD)
 - § Reduced level of the ground adjacent to the gauge (m OD)
 - § A record of the height of fill placed and the start/finish dates of filling
 - § The total thickness of the fill (m)
 - § A record of extensions to the gauge, including before/after reduced levels of the gauge
 - § The settlement of the plate relative to base readings and previous readings (m)

Piezometers

- 1.5.22 Prior to placing Engineered Fill vibrating wire piezometers (VWP) shall be installed from the base of the excavation. Piezometers will be installed in the underlying pre-existing Made Ground materials. The piezometer locations and response zones are shown on drawings.

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- 1.5.23 The piezometers shall be of the VWP-3000 type and are to be installed by a specialist ground investigation subcontractor who is a member firm of the AGS. Piezometers are to be installed in accordance with the UK Specification for Ground Investigation (2nd Edition). The equipment shall be installed strictly in accordance with the manufacturer's instructions.
- 1.5.24 Prior to installation of piezometers, the piezometer tips shall be thoroughly saturated by boiling them in previously de-aired water. The piezometer shall be assembled and connected to the tubing while still underwater and the entire arrangement kept saturated and filled with de-aired water for at least 24 hours and until it is installed.
- 1.5.25 The following data shall be provided from the VWP readings:
- § Water pressure reading (m water)
 - § File name of data stored on the data logger
 - § Reduced level of piezometer tip as installed (m OD)
 - § Reduced level of ground adjacent to piezometer (m OD)
 - § Estimated or measured settlement of piezometer tip (m)
 - § Water head (m OD)
 - § Water level (m OD)
 - § Change in water head relative to base reading (m)
- 1.5.26 Initial readings shall be taken to demonstrate when conditions have stabilised following installation. Further readings shall be taken as given in Table 1. Monitoring and analysis by the contractor of this data should enable the rate of land raising to be controlled by preventing a build-up of destabilising excess porewater pressures (which could otherwise result in an increased risk of shear failure) and will aid the Engineer in identifying when the rate of settlement has been suitably reduced. The piezometers shall be remotely monitored using data loggers and associated equipment (Contractor to submit proposals 2 weeks ahead of installation).
- 1.5.27 Available ground investigation data suggests that the groundwater level at the site can vary considerably with location and with time. This may limit the usefulness of the piezometer data. This matter is to be kept under review by the Engineer.

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General Monitoring Requirements

- 1.5.28 All level monitoring and surveying should be accurate to within ± 1 mm in the vertical plane and ± 2.5 mm in the horizontal plane.
- 1.5.29 Monitoring of settlement gauges and piezometers is to commence at least 5 days before earthworks materials are placed. The frequency of monitoring observations is given in Table 1 below. In all cases the frequency of readings may be altered at any time by the Engineer if circumstances so dictate.

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Table 1: Instrument Reading Frequency Summary

Instrument	Initial Reading(s)	Commence Sequential Readings	Initial Sequential Frequency ¹	Subsequent Frequency ¹	Surcharge Removal ^{1,2}
Settlement Gauges	Survey position and level immediately following installation	5 days prior to placement of earthworks in the surrounding area	Daily (Monday to Friday) until 15 days have elapsed past completion of surcharge earthworks. Then twice weekly until one month has elapsed.	Weekly for the three subsequent months and then monthly	Daily until 2 weeks after the surcharge is fully removed, then as advised by the Engineer subject to results from the 2 week period .
Piezometers	Daily following installation until stable reading obtained. Readings can then be suspended until commencement of sequential readings	5 days prior to placement of earthworks in the surrounding area	Daily (Monday to Friday) until 15 days have elapsed past completion of surcharge construction. Then twice weekly until one month has elapsed	Weekly for the three subsequent months and then monthly	Daily until 2 weeks after the surcharge is fully removed, then as advised by the Engineer subject to results from the 2 week period.

Note: 1. This period may be extended by the Engineer if monitoring suggests insufficient diminution of settlement rate or pore pressures.
2. The surcharge removal and heave monitoring is a two phase operation as outlined below.

- 1.5.30 For each 40x40m area of treatment the twice weekly, weekly and monthly observations are to be made on the same day. To achieve this when different installations are completed at different times in one location, an initial interval shall be reduced to achieve synchronisation, rather than extended.
- 1.5.31 During the monitoring programme, the Contractor shall report on results twice a week from initial reading through to 15 days after completion of the surcharge placement, and then at weekly intervals.
- 1.5.32 The Contractor shall be responsible for preparing a final factual report (paper and pdf copy) of the instrumentation, installation and monitoring, and including graphical plots of the monitoring results. The draft reports shall be forwarded to the Engineer for comment within 2 weeks following physical completion of the works. The Contractor shall forward 2 bound copies of the final report to the Engineer the within 2 weeks of receipt of any comments from the Engineer.

Calibration Requirements

- 1.5.33 The Contractor shall test the whole instrumentation installation by taking three sets of base readings at suitable intervals and shall provide two copies of the results to the Engineer and shall satisfy him that all instruments are functioning correctly and readings are repeatable before the associated earthworks are commenced.
- 1.5.34 After installation, the functioning and monitoring of each instrument shall be demonstrated to the Engineer, including the recording of measured values using the appropriate readout device.

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As part of the commissioning, three sets of readings shall be taken and compared. If there are significant differences or anomalies, then further readings shall be taken. For instruments installed prior to the earthworks commencing this process is to be repeated at the start of the earthworks. Once two sets of comparable data have been obtained, these shall be averaged to form the base reading, representing the conditions before the start of earthworks.

- 1.5.35 In cases where instruments are installed during earthworks, three sets of readings shall be taken in quick succession and the results compared. These results shall be used to provide base readings in a manner to be agreed with the Engineer.

Protection of Instruments

- 1.5.36 The Contractor shall take all necessary precautions to protect the instruments and maintain the instruments in good working order after commissioning. For all instruments which project through and above the fill, special precautions shall be taken to provide protection from vehicles and plant, including substantial and readily visible barriers at a distance of no less than 750mm around each instrument

- 1.5.37 Heavy compaction equipment shall not approach within 5m of projecting instruments. Compaction around any cabling to be by hand held tools and to be in accordance with the manufacturer's requirements.

- 1.5.38 Cables and connections are to be of a form that can withstand the subsequent placement of materials settlement and weathering they are to have appropriately welded joints and protection as needed to ensure they do not malfunction under loading of soils and traffic. Adequate cable slack shall be provided during installation to prevent failure as a result of stretching. If the specialist installer wishes to propose an alternative design to ensure the protection of cables this shall be submitted to the Engineer with an associated method and design 14 days prior to works and subject to the Engineer's approval. The cabling shall not be placed within the Engineered Fill as this could present a potential hydraulic pathway.

- 1.5.39 Adequate protection measures shall be provided for all new and existing instrumentation to protect it from vandalism or damage during construction.

- 1.5.40 Any damage to instruments or cabling shall be reported immediately to the Engineer. Damaged instruments and cabling shall be replaced or repaired by the Contractor at his own expense within seven days of its reported damage.

- 1.5.41 Should any settlement monitoring location be damaged or moved, a new level should be taken on the damaged rod immediately and the incident reported to the Engineer. Earthworks must be suspended in that area until the problem has been resolved. Replacement of the damaged rods and plates may be required.

1.6 Surcharge Removal

- 1.6.1 The surcharge is only to be removed when instructed by the Engineer based on 1.3.9 and 1.3.10. As noted above the basal 250mm of the surcharge materials will comprise Engineered Fill. Based on a survey of the upper surface of this Engineered Fill (at the time of placement as discussed in Appendix 6/13 C1.3.1) and monitoring results the contractor shall confirm that the upper surface this Engineered Fill is above finished earthworks level. The contractor shall provide this confirmation a least 1 week before excavation of the surcharge commences.

- 1.6.2 The surcharge removal is to be done in two stages comprising (i) lowering the surcharge mound by 2m and (ii) then removal of the remaining surcharge materials down to finished earthworks level. During and after each stage of soil removal the settlement gauges are to be

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monitored. For each stage this monitoring is to continue until, to the satisfaction of the Engineer, any heave has effectively ceased.

- 1.6.3 During and after surcharge removal operations great care shall be taken by the contractor so as to prevent damage to the RSGs or other effects that could influence the results (e.g. vibrations from plant, including haulage plant) and temporary haul roads are to be constructed no closer than 10m from the RSGs. Such requirements apply to the RSGs until the Engineer instructs their removal. The process for maintaining the settlement gauges during the excavation of the surcharge mound shall be proposed by the Contractor and agreed with the Engineer not less than 2 weeks prior to the removal of surcharge.
- 1.6.4 At the start of the surcharge removal operation all the RSGs are to be resurveyed. As the surcharge is removed the RSGs are to be sequentially dismantled in such a manner that they can still be used to determine movements of their respective base plates. This is to be a closely controlled operation undertaken by the contractor. Levels shall be taken of the top of the rod and the fill adjacent to the gauge on each occasion. When rods are removed, levels (including the level of the base plate upon removal of the final rod) shall be measured immediately before (on the rod to be removed and that left insitu) and immediately after removal (on the rod length left insitu). Good levelling practice shall be observed.
- 1.6.5 Removal of the surcharge shall be a controlled operation so as to prevent damage of the underlying Engineered Fill. Once the surcharge has been removed and once instructed by the Engineer based on 1.6.2 above, the Rod Settlement Gauges are to be grubbed out and reinstated with Engineered Fill so as to ensure that the Engineered Fill is as specified and its integrity as a low permeability layer maintained. Once the surcharge is removed down to final formation the formation is to be inspected for any soft spots or relict surcharge materials, which are to be removed and placed with Engineered Fill placed and compacted in accordance with this specification. The whole surface is to be recompacted using the same compaction technique used in its initial construction, the surface surveyed and, if required, brought up with the same materials placed and compacted in accordance with the specification.
- 1.6.6 During surcharge removal, the Contractor shall report on monitoring results (see Table 1 above for monitoring frequency) daily from commencement of surcharge removal in the vicinity of the RSG through to 2 weeks after complete removal. The need for and frequency of any continued monitoring and reporting shall be reviewed by the Engineer after the initial 2 week period.

1.7 Survey of Completed Works

- 1.7.1 On completion a full 3D topographic survey referenced to ordinance datum is to be undertaken to enable a cross check against design formations to be undertaken.

1.8 Reporting of the Surcharged Area

- 1.8.1 See CI 1.5.31, CI 1.5.32 and 1.6.6 for frequency of reporting associated with monitoring.
- 1.8.2 On completion of the works a detailed Ground Treatment Completion Report will be provided by the Contractor for each sub-phase (refer to 11950-SK107 for sub-phases) subject to surcharge treatment. The reports will describe the procedures undertaken at the site and include all relevant factual data for the ground treatment works. They shall also include information needed for completion of the geotechnical feedback report as defined in Design Manual for Roads and Bridges (BMRB) HD22/08 Managing Geotechnical Risk.
- 1.8.3 This reports shall include all relevant site records and illustrate that the remedial and ground preparation works have been carried out in accordance with the design. The report are to be provided at the conclusion of the works (including the surcharge/monitoring period).

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1.8.4 The reports shall include but not be restricted to:

- As required by Appendix 6/3 S22
- any supplementary ground investigation undertaken;
- the design information and design revisions or additional design work that arise during the works;
- all records referred to elsewhere in this specification;
- full details of all instrumentation and associated ground conditions;
- all monitoring data associated with the works.

1.8.5 The reports shall also include:

- daily record sheets to include a summary of the day's activities in relation to the ground improvement operations;
- progress photographs;
- general description of the works completed, including any earthworks, excavations (including excavations of hard obstructions or foundations), placement and compaction methodology and plant used;
- information on weather conditions;
- application of acceptability criteria and a summary of control test results sufficient to allow interpretation by the Engineer for each specific earthworks material placed during the ground improvement operations;
- geotechnical test certificates and monitoring data including location and level, with associated drawings;
- as built surveys (to include drawings);
- drawings showing the location and level of each specific earthworks material placed during the ground treatment operations, any feature or operation relevant to the works including instrumentation and the location of trial areas and control tests;
- Full as-built details of all monitoring instruments installed and associated exploratory hole records;
- All monitoring data relating to surcharge monitoring or as otherwise required by this Specification.

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APPENDIX A

EARTHWORKS – SUPPLEMENTARY INFORMATION FOR SITE SURVEYOR

- Set out and establish the level and coordinates of a stable datum monitoring point remote from the influence of the works to which subsequent monitoring will be related.
- Set out monitoring station plate positions, using suitable co-ordinates and record the existing ground level.
- When the monitoring station plate is positioned record precisely the level of the base plate, plus the top of the first rod fitted.
- During the earthwork and surcharge operations, monitor on a daily basis the precise level of the top of rod on each monitoring station plate together with the surface level of the adjacent Engineered Fill.
- When monitoring station rods are raised during earthworks, level the top of the existing rod, top of the new rod placed and the then existing adjacent ground level.
- Survey the positions extent and levels of completed surcharge mounds for checking against design.
- Survey the finished level of the engineered material using a 25m grid and check that the design tolerances have been achieved.
- Survey the finished level of the base of the treated material using the 25m grid and check that the design tolerances have been achieved.
- Survey compliance test locations and levels within the Engineered Fill.
- Provide the foregoing services for any trial loading panels specified.
- All monitoring station levels should be recorded to an accuracy within + or – 1mm using an automatic barcode reading level.

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND ENVIRONMENT

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

TABLE 6/14: (11/04) LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

	Units	Upper 2.00m Engineered Fill*	General Fill Beneath 2.00m final earthworks level **
GENERAL REQUIREMENTS			
Asbestos ^c	% weight	<0.001	<0.1
Arsenic ^a	mg/kg	37	n/a
Cadmium ^a	mg/kg	26	n/a
Chromium (total)	mg/kg	910	n/a
Lead ^a	mg/kg	200	n/a
Mercury (total)	mg/kg	40	n/a
Selenium	mg/kg	250	n/a
Nickel	mg/kg	180	n/a
Copper	mg/kg	2400	n/a
Zinc	mg/kg	3700	n/a
Benzo(a)pyrene ^a (use as surrogate for PAH)	mg/kg	5.0	n/a
TPH Total ^b	mg/kg	260	n/a
Aliphatic >C5 – C6	mg/kg	42	n/a
Aliphatic >C6 – C8	mg/kg	100	n/a
Aliphatic >C8 – C10	mg/kg	27	n/a
Aliphatic >C10 – C12	mg/kg	130	n/a
Aliphatic >C12 – C16	mg/kg	1100	n/a
Aliphatic >C16 – C21	mg/kg	1100	n/a
Aliphatic >C21 – C35	mg/kg	1100	n/a
Aromatic C5 – C7	mg/kg	70	n/a
Aromatic >C7 – C8	mg/kg	130	n/a
Aromatic >C8 – C10	mg/kg	34	n/a
Aromatic >C10 – C12	mg/kg	74	n/a

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

	Units	Upper 2m of Engineered Fill *	General Fill Beneath 2m below final earthworks level
GENERAL REQUIREMENTS			
Aromatic >C12 – C16	mg/kg	140	n/a
Aromatic >C16 – C21	mg/kg	260	n/a
Aromatic >C21 – C35	mg/kg	1100	n/a
Phenols	mg/kg	120	n/a
Cyanide (total) ^c	mg/kg	18	n/a
pH	Units	5 – 10	n/a
<p>* based on a residential with plant uptake end use ** 1 sample every ten will also be analysed for the full suite (i.e. as per the samples for the upper 2m engineered fill) S4ULs used unless otherwise stated (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL 3036. All rights reserved) ^a – C4SL used ^b – Based on the S4UL for Aromatic C16 – C21 but assumes no petroleum hydrocarbon contamination is present ^c – S4UL and C4SL not generated, use in-house GAC/value</p>			

1.0 LABORATORY AND SAMPLING REQUIREMENTS ARE PROVIDED BELOW

1.1 Purpose

1.1.1 The works specified herein are required to ensure a minimum standard for the preparation and receipt of analytical data from the works for comparison to the Limiting Values set for the works. The Contractor shall also satisfy the requirements of BS 5930 and 10175, as subsidiary standards in the completion of all fieldworks and sampling and any supplementary investigations required. In addition works shall be undertaken in accordance with the ICE Specification for Ground Investigation (2nd Ed). This document shall be read in conjunction with other related Specifications and where any ambiguity arises this shall be clarified with the Engineer.

1.2 Protocol

1.2.1 The Contractor shall supply suitably qualified specialist environmental staff to carry out the monitoring works. All sub-contractors should have in place appropriate written quality control and quality assurance procedures. Evidence of UKAS and MCERTS accreditation for the specified chemical analytical testing and testing laboratory shall be provided to the Engineer. All testing shall be UKAS and MCERTS accredited where this is currently available. All sampling, monitoring and subsequent analysis shall be documented and managed using a Chain of Custody system to track the fate of all samples. All field and laboratory analytical results shall be reported to the Engineer for review and subsequent inclusion within the Contractor's Validation Reports.

1.3 Laboratory Testing

1.3.1 All preparation, testing and reporting shall be where applicable in accordance with the relevant British Standards. Where tests are not covered by British Standards they shall be performed in accordance with the procedures in the references or as described in the Schedules. Analysis of

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

samples will also be required for waste classification purposes. The scope of such testing shall be determined by the Contractor in accordance with the technical requirements of Environment Agency guidance for Waste Classification (EA Document WM2 as revised (assumed to be WM3 circa 2015)).

1.4 Personnel

- 1.4.1 The Contractor shall nominate an individual Technical Advisor to control all processes associated with site investigation, analysis and data management. The person should be suitably qualified. Details of the required qualifications for each of these proposed designations are given in SITE INVESTIGATION STEERING GROUP, *Site investigation on construction. Part 2: Planning procurement and quality management of site investigation*. London: Thomas Telford, 1993. This person shall be Qualified as Section 2.2e (or greater) e.g. a Chartered Engineer/Geologist/Environmental Scientist with at least 5 years of relevant experience.

1.5 Further Investigation

- 1.5.1 Where any additional site investigation, including groundwater monitoring or associated boreholes, are required, the Contractor shall submit proposals for the scope and detail of works proposed for the approval of the Engineer. This shall accord with the requirements of the technical standards noted above.

2.0 SAMPLING PROTOCOL

- 2.1 Samples of suspected contaminated ground, groundwater and leachate for chemical analysis shall be taken in accordance with BS10175 and the companion publication (UK Specification for Ground Investigation, 2nd edition (Site Investigation Steering Group, 2011) under the supervision of an appropriately qualified environmental scientist (SISG 2.2d or more).
- 2.2 The size and type of sample and container, method of sampling and time limitations for carrying out specific analyses shall be commensurate with current guidance.
- 2.3 As a minimum: soil samples shall comprise as a minimum a 1kg plastic tub and 500ml glass bottle; and, water samples shall comprise a 1l plastic and 1l glass bottle.
- 2.4 Sampling shall be undertaken such that cross contamination between samples and sampling locations does not occur. Sampling utensils shall be stainless steel and shall be cleaned prior to the commencement of the excavation works as a minimum and between holes. Where visual or olfactory evidence of contamination is noted equipment shall be cleaned between each sample retrieval.
- 2.5 All samples shall be examined and described by a suitably qualified geotechnical engineer meeting the requirements of BS EN ISO 14688-1:2002. Samples of suspected contaminated ground and leachate shall be described by a qualified environmental or geotechnical person meeting the requirements of SISG Clause 2.2 item d). Descriptions shall include colour and smell with reference to specific inclusions.
- 2.6 All samples shall be labelled with sample location, depth, sample ID (job number, client reference, AGS sample type), time and date of collection. All samples for contamination analysis shall be stored and transported in cool boxes with pre-frozen ice packs and submitted directly to the laboratory from the site within 24hrs of sampling. Samples shall be protected to ensure that their temperature does not fall below 2°C or rise above 45°C. They shall also be protected from direct heat and sunlight.

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

2.7 A 'Chain of Custody' form shall accompany each batch of samples with a copy retained on-site during works and submitted to the Engineer with the exploratory hole logs. The Chain of Custody shall include the sample details in full combined with any special instructions indicated by the Engineer.

3.0 LABORATORY & ANALYTICAL METHODOLOGY ACCREDITATION

3.1 Accreditation

3.1 The Contractor shall select laboratories which are compliant to ISO 17025 and MCERTs. Where necessary, the Contractor may need to use a range of laboratories to ensure that all reported results meet these accreditations. In particular, it is noted that all asbestos testing must be undertaken by a laboratory who are ISO 17025 accredited for the test. With respect to asbestos in soils analysis the laboratory proposed must have undergone an inspection in accord with UKAS ABS001 note during 2011.

4.0 DATA MANAGEMENT

4.1 All chemical data shall be provided in Adobe PDF, 'CrossTab' collated Microsoft Excel, and validated AGS 4.0 format. AGS data shall be complete with wider site data such as stratigraphy and sample coordinates. AGS data shall be compiled into a single file by the Contractor and forwarded to the Engineer on a weekly basis.

4.2 All laboratory test results must be submitted in **full** accordance with The Association of Geotechnical and Geoenvironmental Specialists (AGS) version 4 standard (available on the AGS website: <http://www.ags.org.uk/site/datatransfer/intro.cfm>). Each AGS data file must be checked for errors (i.e. must not contain warnings, structural or integrity errors) before it is submitted and it must be accompanied by an error log file to verify.

4.3 On receipt of the AGS file, the Engineer will check for errors before loading it into its central database. If any errors are found, the data shall be returned to the Contractor (accompanied with an error log file detailing all errors) for corrections and editing.

4.4 The Engineer will not accept and will return to the Contractor any data that does not meet the AGS standards or has not been checked (i.e. is not accompanied by an error-free log file).

4.5 In addition to the above requirements, chemical analysis spread sheets shall be provided in:

- Excel spread sheet format that shall follow a consistent order and format for rows and columns to allow direct referencing across a given row/column for either a single determinant across all exploratory samples or vice versa all results for a single exploratory sample;
- Separate sheets shall be provided for the analysis results for soil, water, leachate and gas;
- Each of the spread sheet fields shall be populated free of hidden data, spaces, or other insertions (other than explained symbols) that inhibit interpretation of data;
- The detection limit applicable to each chemical analysis, agreed at appointment, shall remain consistent throughout the works; and,
- The units of expression shall be consistent (e.g. micrograms or milligrams) and shall remain consistent throughout the works for a given medium and parameter.

APPENDIX 6/14: LIMITING VALUES FOR HARM TO HUMAN HEALTH AND THE ENVIRONMENT

5.0 DATA QUALITY

5.1 Provision shall be made for a suitable quantity of blanks and duplicate sampling to be collected and analysed in order to express the sampling and analytical error.

6.0 DATA MANAGEMENT SYSTEM

6.1 The Contractor shall maintain a data management system in order to coordinate all validation testing, appraisals and reporting. This shall be kept current with works with a delay of no more than 2 weeks from the point of a given sample.

6.2 The Contractor shall provide the Engineer with results upon request and present a summary of results at the Progress Meetings of works.

Appendix F

Section 106 Agreements

DATED *28th April* 2016

CREST NICHOLSON OPERATIONS LIMITED

and

PIERS HENRY CALVERT and HENRIETTA AMELIA CALVERT

and

**PIERS HENRY CALVERT and RUTH MARGARET CALVERT AND JULIAN RICHARD
WHATELY AS EXECUTORS OF HENRY CLIFTON CALVERT (DECEASED)**

and

THE HOMES AND COMMUNITIES AGENCY

and

**TRUSTEES OF THE CREST NICHOLSON GROUP PENSION
AND LIFE ASSURANCE SCHEME**

and

THE COUNTY COUNCIL OF WEST SUSSEX

**DEED OF AGREEMENT
UNDER SECTION 106 OF THE TOWN AND COUNTRY PLANNING ACT 1990**

relating to

**PHASED DEVELOPMENT OF THE WEST OF BEWBUSH
(also known as Kilnwood Vale)**

Planning Ref: DC/15/2813
SEC 2238 and DC/15/2561

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THIS DEED OF AGREEMENT dated 20th April 2016

IS MADE BETWEEN:

- (1) **CREST NICHOLSON OPERATIONS LIMITED** (company registration number 01168311) of Crest House, Pycroft Road, Chertsey, Surrey KT16 9GN (the **First Owner**);and
 - (2) **PIERS HENRY CALVERT** and **HENRIETTA AMELIA CALVERT** of Holmbush, Faygate, Horsham West Sussex RH12 4SE (the **Second Owner**); and
 - (3) **PIERS HENRY CALVERT** and **RUTH MARGARET CALVERT** of Holmbush, Faygate, Horsham West Sussex RH12 4SE and **JULIAN RICHARD WHATELY** of Rathbone Trust Company Limited, 1 Curzon Street London W1J 5JB as the Executors of **HENRY CLIFTON CALVERT** (deceased) (the **Third Owner**)
- Parties (1) (2) and (3) collectively referred to as the Owners
- (4) **THE HOMES AND COMMUNITIES AGENCY** of Arpley House, 110 Birchwood Boulevard, Birchwood, Warrington, WA3 7QH (the **First Chargee**); and
 - (5) **TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE SCHEME** being **DUNCAN REVOLTA** of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA AND **JEREMY COLIN FRY** of 49 Park Grove, Westbury-on-Trym, Bristol BS9 4LG AND **BS PENSIONS TRUSTEES LIMITED** (company registration number 2682277) of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA (the **Second Chargee**)
 - (6) **THE COUNTY COUNCIL OF WEST SUSSEX** of County Hall, West Street, Chichester, West Sussex PO19 1RQ ("**County Council**")

NOW THIS DEED WITNESSETH as follows:

1. RECITALS

- (A) The First Owner is the registered proprietor with freehold title absolute registered at the Land Registry under Title Number WSX353549 of that part of the Site shaded purple for identification purposes on the Ownership Plan and which the First Owner warrants is free from incumbrances which would prevent the performance of the obligations contained in this Agreement
- (B) Title number WSX353549 is subject to registered charges in favour of the First Chargee and the Second Chargee

- (C) The Second Owner is the registered proprietor with freehold title absolute registered at the Land Registry under Title number WSX332098 of that part of the Site shaded blue for identification purposes on the Ownership Plan and which the Second Owner warrants is free from incumbrances which would prevent the performance of the obligations contained in this Agreement
- (D) The Third Owner are the Executors in the estate of Henry Clifton Calvert (deceased) in registered freehold title number WSX287388 and the part of the Site shaded yellow for identification purposes on the Ownership Plan is within that title
- (E) Crest Nicholson (South) Limited has submitted the Application to develop the Site in accordance with the Application
- (F) The County Council is a local planning authority pursuant to section 106 (9) of the Act by whom the provisions of this Deed are enforceable and is also a the highway and education and library authority for the area in which the Site is situate
- (G) In July 2009 the District Council (jointly with Crawley Borough Council) adopted the local development framework entitled "West of Bewbush Joint Area Action Plan (2009) - Development Plan Document" (the **JAAP**) which allocates the Site for a strategic housing development together with related retail employment leisure and open space uses, a new neighbourhood centre and a railway station subject to the requirements to satisfy certain planning obligations arising out of the Development
- (H) The JAAP provides a framework for the submission of the Application and the delivery of planning obligations in relation to the creation of a sustainable community on the Site

1. **DEFINITIONS**

In this Deed unless the context otherwise requires:

"A23/A220 Cheals Junction Contribution" means the sum of one million, nine hundred and forty six thousand nine hundred and two pounds (£1,946,902)

"A264/Sullivan Drive Junction Contribution" means four hundred and eighty three thousand one hundred and fifty nine pounds (£483,159)

"Act" means the Town and Country Planning Act 1990

"Affordable Dwellings" means the Dwellings designated as such by the Owners pursuant to the planning Permission and any related planning obligations

"Application" means:

(1) the planning application submitted to the District Council given the reference number DC/15/2813 / for variation of conditions 3, 4, 7, 8, 9 and 10 of hybrid planning permission DC/10/1612 to enable the reconfiguration of the neighbourhood centre, community facilities and open space

(2) the planning application for Phase 1D submitted to the District Council given the reference number DC/15/2561 for the erection of 72 dwellings with associated access, parking and landscaping

(3) the planning application submitted to the District Council given the reference number DC/16/0108 for engineering operations associated with landfill remediation and associated infrastructure including pumping station which replaces part B of the Hybrid Planning Application.

"Approved Plan(s)" means any layout plan(s) approved by the District Council as part of the grant of Reserved Matters Approvals

"BCIS" means the Building Costs Information Service all in tender prices index

"Borough Council" means the Crawley Borough Council

"Bus Service Specification" means the specification and routing of the Shuttle Bus Service and the re-routing of existing bus services referred to in Schedule 4

"Car Driver Targets" means targets as to the projected peak hour movements of private motor cars to and from the Site

"Commence" means the implementation of the Development by the carrying out on the Site of any material operation pursuant to the Permission and for the purposes of this Deed the term "material operation" shall have the meaning set out in sub-sections 56(4) (a) (b) (c) and (d) inclusive of the Act **PROVIDED THAT** for the purpose of determining whether or not such a material operation has been carried out there shall be disregarded any works of demolition site clearance site inspection remediation site surveys testing sampling soil investigations Infrastructure landscaping ecology arboriculture lopping topping felling or other tree works or woodland management archaeological works the erection of fencing or hoardings laying out of access roads Infrastructure site clearance trial holes pegging out site set up contractors compounds signage haul routes and security works - and the expressions **"Commenced"** **"Commencement"** and **"Commence the Development"** shall be construed accordingly

"Completion of the Development" means the Occupation of the final Dwelling constructed as part of the Development

"Community Building" the community building to be constructed by the Owners for the District Council in or adjoining the Neighbourhood Centre

"Contributions" means any and all of the contributions to be paid by the Owners to

the County Council under the provisions of this Agreement

"County Council" means the County Council of West Sussex

"Determination" means the outcome of the statutory processes set down in the relevant Legislation in force at the time of Determination

"Determining Authority" the body that under the relevant regulations issues the Determination

"Development" means the development of the Site pursuant to the Permission

"District Council" means Horsham District Council

"Dwelling" means any unit of residential accommodation (including a flat) within the meaning of Use Class C3a constructed pursuant to and in accordance with the Permission

"Early Years Facility" means two classrooms designed in accordance with DCFS (now Department of Education) guidance "designing for 3-4 year olds" (or such other guidance as may be applicable at the time of construction) dedicated to early years education together with associated parking and external play areas

"Essential Travel Plan Obligations" means the measures identified in Schedule 2 Part 2

"First Secondary Education Contribution" means one half of the sum derived by applying the WSCC Calculator in so far as it relates to secondary school places (excluding sixth form places) to the Notional Dwelling Mix

"Fitted-Out" means the internal fitting out of the Primary School building to an extent and standard consistent with what is within the development industry termed 'Category A' fit-out and which includes:

- Raised floors and suspended ceilings.
- Distribution of mechanical and electrical services.
- Internal surface finishes
- Furniture, fittings and equipment and information technology to a specification agreed in writing with the County Council as part of the Primary School Scheme

"GIA" means gross internal area of a building as measured in accordance with the RICS Code of Measurement 6th edition

"Highway Specification" means the specification of the Highway Works and the Access Works as set out in Schedule 6

"Highway Works" means the Main Access Works the Secondary Access Works and the Off-Site Works

"Hybrid Planning Application" means the hybrid planning application submitted to the District Council for the development of the Site given the District Council's reference number DC/10/1612 comprising the following:

(a) Part A: Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space.

(b) Part B: Full planning permission for engineering operations associated with landfill remediation and associated infrastructure including pumping station

(c) Part C: Full permission for the development of Phase 1 of 291 dwellings, internal roads, garages, driveways, 672 parking spaces, pathways, sub-station, flood attenuation ponds and associated amenity space

(d) Part D: Full permission for the construction of a 3 to 6 metre high (above ground level) noise attenuation landform for approximately 700 metres, associated landscaping, pedestrian/cycleway and service provision (land known as Kilnwood Vale).

"Index-Linked" in relation to any financial contribution or cost mentioned in Clause 4 means varied in accordance with the provisions of Clause 4

"Infrastructure" means all sewers sewerage plant machinery apparatus and equipment and sewerage works drains rising mains and associated manholes mains inspection chambers headwalls public utilities bridges (including any railway and/or river crossings) tunnels and underpasses culverts lagoons balancing ponds flood storage areas pumping stations or pumping apparatus flood plains sound barriers noise attenuation works screens or bunds strategic planting and landscaping open space and other main amenities and accommodation works and all other works services and service media apparatus and equipment that may be required pursuant to this Deed or pursuant to any other planning or infrastructure agreement or otherwise needed in order to commence construct complete sell use and occupy the Development and/or to market and sell all or any of the Dwellings comprised in the Development or any variation amendment or substitution thereof or any Reserved Matters Approvals pursuant thereto together with spine distributor and estate roads (including all works and facilities required to connect such roads to public highways) footways footpaths and cycleways and related verges and local distributor roads footpaths and cycleways bridleways bridlepaths cyclepaths and related verges central reservation roundabout junctions public car parks and principal services and including (for the avoidance of doubt) the Highway Works sewers and drains, gas and water

and electricity mains, equipment estate telephone, television telecommunications and electricity cables services pipes wires cables fibres conduits mains and any other service and conducting media substations gas governors and other related buildings structures works and apparatus

"JAAP" means the local development framework document adopted in July 2009 by the Borough Council and the District Council entitled "West of Bewbush Joint Area Action Plan (2009) - Development Plan Document"

"Legislation" the Education and Inspections Act 2006 for the Establishment Discontinuance and Prescribed Alteration of Schools and given detailed procedures in statutory instruments 2007:1288 and 2007:1289 (or any amendment thereto or substitution therefor)

"Link Road" means the road connecting Phase 1 to the Neighbourhood Centre

"Main Access Works" means the construction of the main roundabout access on the A264 to serve the Site in accordance with the Highway Specification

"Market Dwelling" means any Dwelling other than those identified as Affordable Dwellings

"Master Plan" means the plan annexed hereto marked "Illustrative Masterplan"

"Monitoring" means in relation to the Sullivan Drive Junction Improvement the monitoring procedure outlined in Schedule 6 item 4

"Neighbourhood Centre" means the area identified as such on the Master Plan as qualified by any Reserved Matters Approvals - such centre being designed to accommodate a community building a primary care centre retail facilities shared car parking and other uses

"Net Capacity" means the statutory method for determining the capacity of a school. The capacity is 95% of the number of pupil places a school can accommodate according to the statutory method for measuring the capacity of a school (referenced: DFES/0739/2001 REV Assessing the Net Capacity of Schools)

"Notice of Intended Construction" means a notice served by the County Council on the First Owner giving notice to the First Owner of their intention to construct the Primary School Extension Works the Stage 1 Secondary School Extension Works or the Stage 2 Secondary School Extension Works as appropriate **PROVIDED ALWAYS THAT**

- (a) a Notice of Intention to Construct the Primary School Extension Works may not be served earlier than the date on which the Eight Hundred and Ninth (809th) Qualifying Dwelling shall have been Occupied and may not be served later than the date on which the One thousand Three Hundred and Ninth (1309th) Qualifying Dwelling shall have been occupied

- (b) a Notice of Intention to Construct the Stage 1 Secondary School Extension Works may not be served earlier than the date on which the One thousand Two Hundred and Ninth (1209th) Qualifying Dwelling shall have been Occupied and may not be served later than the date on which the One thousand Five Hundred and Ninth (1509th) Qualifying Dwelling shall have been Occupied
- (c) a Notice of Intention to Construct the Stage 2 Secondary School Extension Works may not be served earlier than the date on which the Two thousand and Ninth (2009th) Dwelling shall have been Occupied and may not be served later than the date on which the Two thousand Two Hundred and Ninth (2209th) Dwelling shall have been Occupied

"Notice of Intention to Commence Development" means a notice confirming the Owner 's intention to Commence the Development

"Notional Dwelling Mix" means the notional dwelling mix and housing numbers contained in the first and second columns of the dwelling mix table at Schedule 7

"Occupation" means first residential occupation of a Dwelling save for the purpose of fitting out or marketing and the expressions **"Occupy"** and **"Occupied"** shall be construed accordingly

"Off-Site Works" means the works of improvement to the existing highway (to be carried out entirely within highway limits) as described in the Highway Specification

"Payment Table" means the table identifying financial contributions towards Off-Site Works set out in Schedule 5

"Permission" means any planning permission granted by the District Council pursuant to the Application

"Phase" means any of Phase 1D Phase 2 Phase 3 Phase 4 or Phase 5

"Phase 1D" means the land identified as such on Plan 1

"Phase 2" means the land identified as such on Plan 1

"Phase 3" means the land identified as such on Plan 1

"Phase 4" means the land identified as such on Plan 1

"Phase 5" means the land identified as such on Plan 1

"Plan 1" means the plan annexed hereto and marked "Kilnwood Vale S106 Agreement Phasing Plan drawing number 403"

"Plan 2" means the plan annexed hereto and marked "Kilnwood Vale S106 Agreement Title Plan drawing number 401"

"Plan 3" means the plan annexed hereto and marked "Kilnwood Vale S106 Agreement School Site & Extension drawing number 404"

"Primary School" means a 2 Fe school for primary age pupils to be constructed on the Primary School Site in accordance with the Primary School Scheme and which building shall incorporate the Early Years Facility

"Primary School Extension Works" means the extension of the Primary School to form a three form of entry primary school on the Primary School Site and the School Extension Land in accordance with a Determination authorising the same

"Primary School Scheme" means a written scheme for the design, fit out and construction of the Primary School (incorporating the Early Years Facility) to be compliant with the minimum standards set out in 'Building Bulletin 103: Area Guidelines for Mainstream Schools' published by the Department for Education and the building shall be designed with core facilities that are capable of accommodating future expansion of the primary school (by the County Council) to 3Fe together with associated grounds and parking areas

"Primary School Site" means the site identified as such on Plan 3 (or any amendment or variation thereto approved by the County Council) upon which the Primary School is to be constructed comprising an area of 2.35 hectares

"Primary School Extension Site Option" means an option to acquire the School Extension Land such option to be substantially in the form annexed in Schedule 1 subject to such amendments as are appropriate to reflect the terms of this Deed

"Qualifying Dwelling" means any Dwelling which is a house or flat with more than one bedroom but excluding special needs housing and elderly persons accommodation care home retirement housing or extra care housing

"Relevant Index" means the index applicable to the relevant Contributions as set out in Clause 4

"Reserved Matters Approvals" means the approval of any matter identified as a "reserved matter" in the Permission and which is reserved for subsequent approval under the conditions of the Permission

"Reserved Matters Submissions" means the submission of details of any matter identified as a "reserved matter" in the Permission and which is reserved for subsequent approval under the terms of the Permission

"Resources Centre" means a building which unless otherwise agreed by the County Council shall contain approximately 150 Sq metres gross floorspace on all floors (as measured in accordance with the RICS Code of Measurement 6th edition and which shall be designed for and capable of use for library social community and leisure purposes including internet based resource facilities which Resources Centre may (for the avoidance of doubt) subject to the approval of the County and the District

Councils in their absolute discretion form part of the Community Centre or be constructed either as a free standing building or as part of another building elsewhere on the Site)

"Resources Centre Contribution" means £176,470 this being a contribution towards the construction of a Resources Centre on the Site or a contribution towards the provision of library and other facilities to serve the Development either on or off the Site or by way of revenue support for such facility but which shall only become payable if the Resources Centre is not to be constructed as part of the Community Building

"School Extension Land" means the area identified for the purposes of identification only as such on Plan 3 being contiguous with the Primary School Site and being 0.42 hectares or thereabouts in extent to allow for the Primary School to be a three form entry primary school if Determined as such

"Second Secondary Education Contribution" means one half of the sum derived by applying the WSCC Calculator in so far as it relates to secondary school places (excluding sixth form places) to the Notional Dwelling Mix

"Secondary Access Works" means the creation of a secondary traffic signalised/ construction access to serve the Site from the A264 in accordance with the Highway Specification

"Secretary of State" means the Secretary of State for Communities and Local Government or such other minister or secretary of state who shall exercise planning powers on the part of the government

"Section 38 Agreement" means an agreement under Section 38 of the Highways Act 1980

"Section 278 Agreement" means an agreement under Section 278 of the Highways Act 1980

"Sections 278/38 Agreement" means an agreement under Sections 278 and 38 of the Highways Act 1980

"Serviced" means the provision of the following:

- Pedestrian and vehicular access
- drainage connections
- utilities connections and associated Service Media

"Service Media" means pipes wires and cables connecting to existing mains services of a size and capacity capable of accommodating the Primary School and its

extension to form a three form of entry primary school

"Shuttle Bus Service" means the shuttle bus service to and from the Site as described in the Bus Service Specification

"Site" means the land edged red on Plan 1

"Stage 1 Secondary School Extension Works" means the first of two separate extensions of the Ifield Community College and/or the Holy Trinity School and/or such other secondary school as may be agreed by the First Owner to increase their Net Capacity by providing additional secondary school places (other than sixth form places) to respond to the demand generated by the Development in accordance with a Determination authorising the same AND the

"Stage 2 Secondary School Extension Works" means the second of two separate extensions of the Ifield Community College and/or the Holy Trinity School and/or such other secondary school as may be agreed by the First Owner to increase their Net Capacity by providing additional secondary school places (other than sixth form places) to respond to the demand generated by the Development in accordance with a Determination authorising the same

"Sullivan Drive Junction Contribution" means the sum of four hundred and eighty three thousand one hundred and fifty nine pounds (£483,159)

"Travel Plan" means the travel plan substantially in the form annexed in Schedule 2 Part 1

"Travel Plan Coordinator" means a person appointed by the First Owner and approved by the County Council amongst whose duties will include the coordination of the Travel Plan and arranging meetings of the Travel Plan Steering Group

"Travel Plan Period" means from the Commencement until the Completion of the Development





















"Travel Plan Steering Group" means a group which will meet at least once a year to discuss the operation of the Travel Plan which group shall be established by the First Owner and whose representatives shall include (in so far as they agree to participate) one or more representatives of the First Owner a representative of the County Council and two or three representatives of the residents of the Development (when occupied) - the first of which residents' representative shall be invited to join the group during the first Occupations of the Phase 1D Dwellings - the second of which residents' representative shall be invited to join the group during the first Occupations of the Phase 3 Dwellings - the third of which residents' representative shall (but only if the first two representatives are not both members of the residents association or the board of any management company) be invited to join the group during the first Occupations of the Phase 4 Dwellings

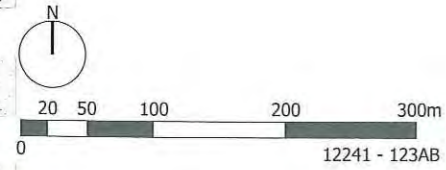
"Use Class" means any specified use class or subclass contained in the Town and

Kunigun

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- Legend
-  Site Boundary
 -  Residential
 -  Residential (subject to detailed planning approval)
 -  Neighbourhood Centre
 -  Land Reserved for Employment
 -  2FE School Land
 -  Reserve Land for 3FE School
 -  Key Frontage
 -  Main Infrastructure
 -  Car Park
 -  Squares
 -  Open Space
 -  Formal Provision
 -  Existing Vegetation
 -  Proposed Vegetation
 -  Proposed Balancing Ponds
 -  Station
 -  Pumping Station
 -  Clubhouse
 -  Embankment



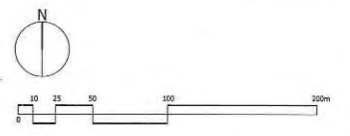
Contractors are not to scale dimensions from this drawing

- Legend
-  Site Boundary
 -  Phase 2
 -  Phase 3
 -  Phase 4
 -  Phase 5
 -  Reserve Land
 -  Phase 1D

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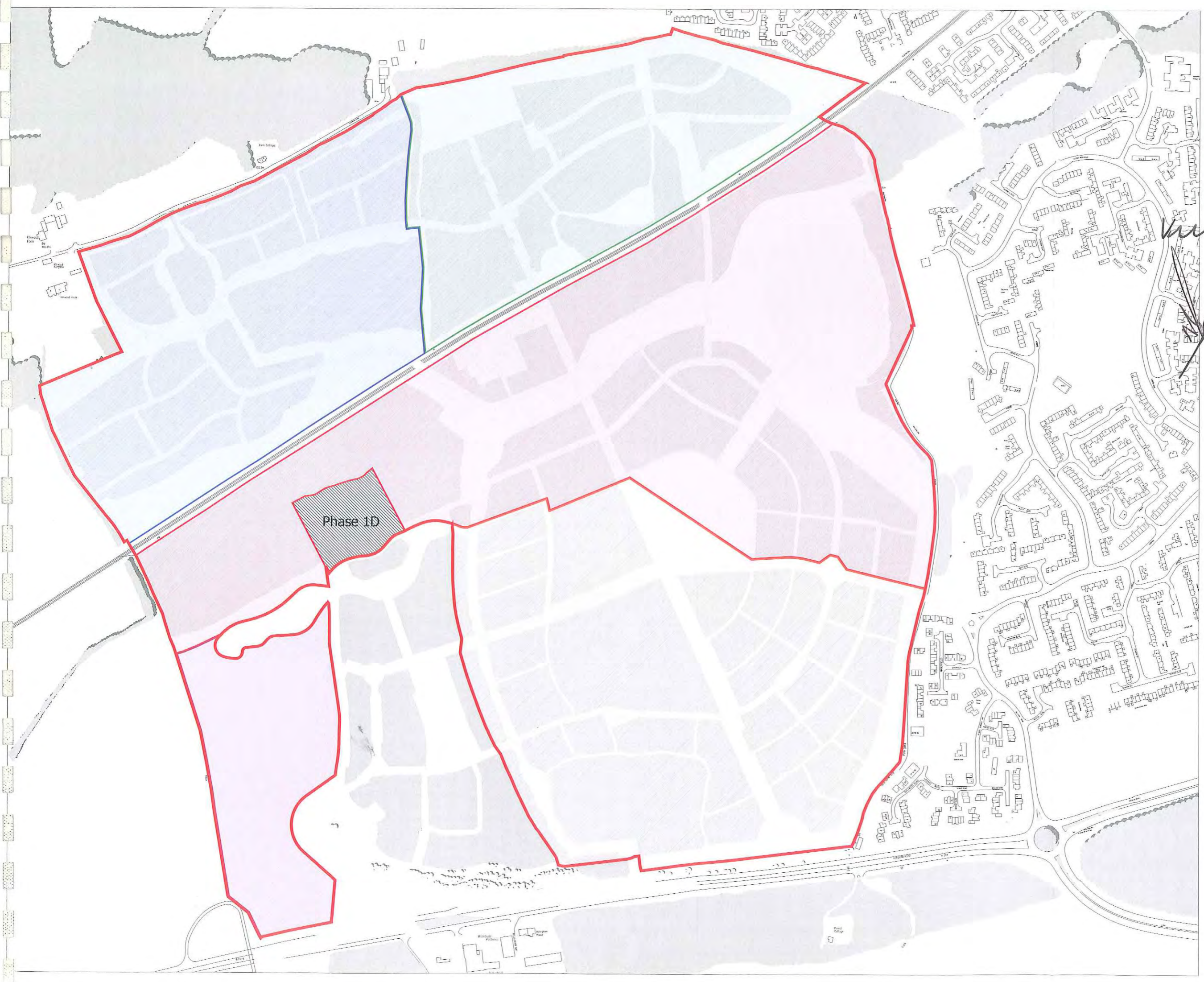
Client
Crest Strategic

Project
**Kilnwood Vale
Bewbush, Crawley**

Description
**S106 Agreement -
Phasing Plan**







Status

Scale	Drawn By	Date
1:2500@A1	NT	Mar 2016
Job Number	Drawing Number	Revision
30885	403	

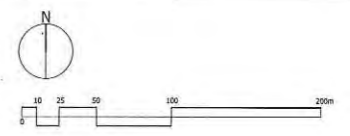


Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  Land Registry Title Number: WSX332098
-  Land Registry Title Number: WSX353549
-  Land Registry Title Number: WSX287388
-  Railway - Unregistered
-  Phase 1D - Land Registry Title Number: WSX353549

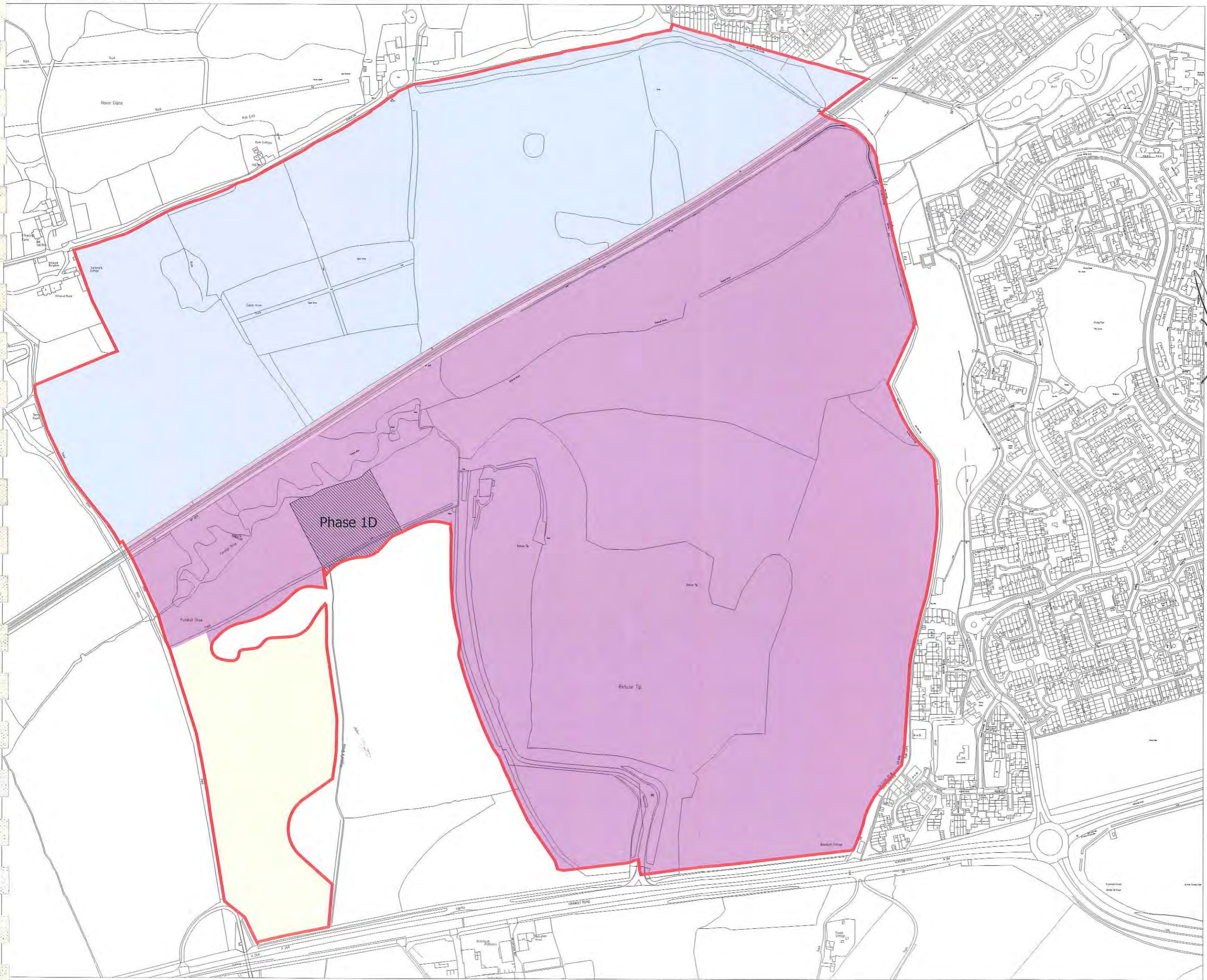
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Client: Crest Strategic
 Project: Kilnwood Vale
 Bewbush, Crawley
 Description: Kilnwood Vale S106 Agreement
 Ownership Plan

Status		
Scale	Drawn By	Date
1:2500@A1	NT	Mar 2016
Job Number	Drawing Number	Revision
30885	401	



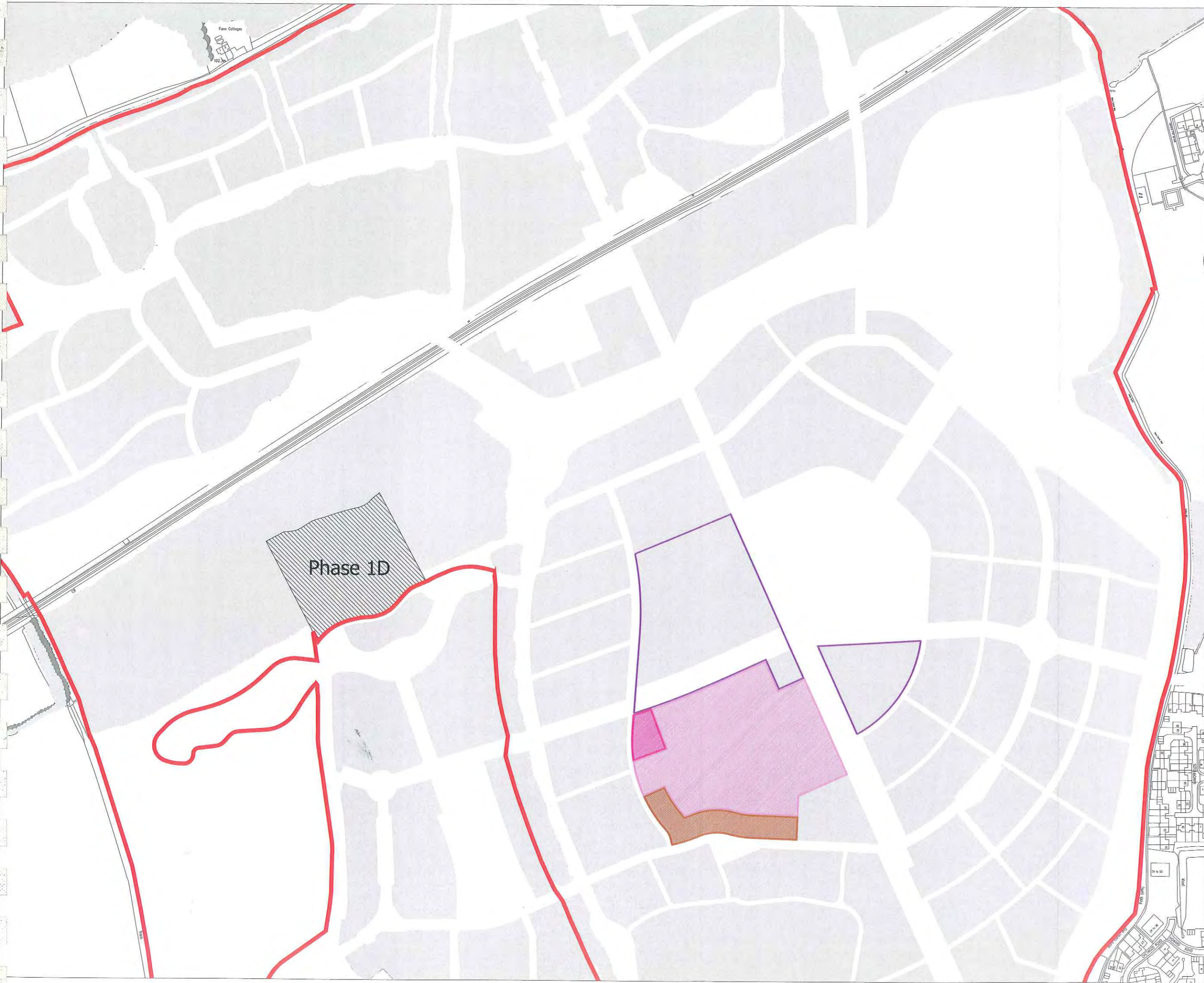
Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  School Site
-  School Site Extension
-  Early Years Facility Site
-  Neighbourhood Centre Boundary

 Phase 1D

Handwritten signatures:
 [Signature]
 [Signature]
 [Signature]



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Client
Crest Strategic

Project
**Kilnwood Vale
Bewbush, Crawley**

Description
**S106 Agreement -
School Site & Extension**

Status

Scale	Drawn By	Date
1:2500@A2	NT	Mar 2016
Job Number	Drawing Number	Revision
30885	404	

Country (Use Classes) Order 1987 as amended

"**WSCC Calculator**" means the West Sussex County Council's "S106 contributions calculator" for Horsham using the County Council's 1st April 2010 template and which tool is used for calculating education contributions from new developments

2. INTERPRETATION POWERS QUALIFICATIONS AND EXCLUSIONS

2.1 In this Deed the singular includes the plural

2.2 Where a party includes more than one person any obligations of that party shall be several

2.3 References to Clauses Sub-Clauses and Schedules are references to clauses sub-clauses and schedules to this Deed

2.4 The Schedules hereto shall be deemed to be incorporated herein and to have the same force and effect as if the provisions thereof were set out in the body of this Deed

2.5 Any paragraph headings in the body or in any Schedule to this Deed are for ease of reference only and are not to be taken into account in construction of this Deed

2.6 The expression "the Owners" shall save where the context admits include their respective successors in title and assigns and where the context admits the expression "the County Council" shall include their respective successors to their statutory duties and powers or any person to whom they dispose of any interest in any land the subject of or affected by this Deed

2.7 The County Council is for the purposes of the Act a local planning authority for the area in which the Site is situated and by whom the obligations restrictions stipulations conditions and covenants contained in this Deed are enforceable

2.8 This Deed is made pursuant to the provisions of Section 106 of the Town and Country Planning Act 1990 and is intended to regulate the use and development of the Site with the intent that the obligations herein shall be planning obligations enforceable as appropriate by the County Council with the intention such planning obligations shall subject to the provisions of Clause 3 bind and run with the Site

2.9 No person shall be liable in respect of any covenant restriction or obligation (or any breach thereof) once they shall have parted with their interest in that part of the Site to which the relevant covenants restrictions or obligations relate

2.10 The obligations restrictions and covenants contained in this Deed shall not be enforceable by or against any mortgagee to an Affordable Housing Provider save to the extent that is specifically provided for in this Deed or against any purchaser tenant or occupier of any individual Dwelling or the mortgagee of any such persons or persons deriving title through or under any such persons or their successors in title

and assigns or their mortgagees nor shall the consent seal or signature of any such persons or their mortgagees be required to amend adjust or supplement this Deed

2.11 The obligations shall not be enforceable by or against any mortgagee or chargee of any part of the Site unless they become a mortgagee in possession

3. **CONDITIONALITY**

Save for this Clause and any provision needed to give effect to this clause this Deed is conditional upon and shall not take effect until all the following conditions shall have been satisfied:

3.1 the Permission shall have been granted and issued by the District Council

3.2 a period of 6 weeks shall have elapsed without any person having applied for leave to apply for judicial review of the Permission and/or this Deed or any decision or resolution of the District Council or the County Council in relation to this Deed or the Permission

4. **INDEXATION**

Indexation

All financial contributions or payments payable under Clause 8.4 and 8.6 shall be adjusted by the percentage change (if any) in the Index between its value as at the date of its last publication prior to the Base Date or between its Base Value (as appropriate) and its value as at the date of its last publication (here including any forecast index which may have been published in advance of any final index) immediately prior to the date the relevant payment of such contribution or instalment thereof is due in accordance with the following table:

Column 1	Column 2
CONTRIBUTION	INDEX AND BASE DATE/BASE VALUE
NON-HIGHWAY CONTRIBUTIONS	
1. First Secondary Education Contribution	BCIS/Base Value 240
2. Second Secondary Education Contribution	BCIS/Base Value 240
3. Resources Centre Contribution	BCIS/Base date – being 17 th October 2011
HIGHWAY CONTRIBUTIONS	
8. Sullivan Drive Junction Improvement	BCIS/Base Date - being 17 th October 2011
9. Cheals Junction Phase 2 Contribution	BCIS/Base Date - being 17 th October 2011
10. Travel Plan measures	BCIS/Base Date - being 17 th October 2011

5. **VARIATIONS OF THIS DEED**

Without prejudice to the terms of this Deed which already allow certain matters to be varied by agreement in writing between the Owners and the County Council the Parties hereby acknowledge and declare that in respect of any of the planning obligations created by this Deed which are to be performed or complied with on a part or parts of the Site then those obligations may be varied by a deed of modification pursuant to Section 106A of the Act provided that deed is entered into by all the parties who have a relevant interest in the part or parts of the Site where those obligations are to be performed or complied with Provided always that such variation does not affect or prejudice the performance of or compliance with the planning obligations on any other parts of the Site

6. **CHARGEES' CONSENT**

The First Chargee and the Second Chargee acknowledge and declare that this Deed has been entered into by the First Owner with their consent to the intent that the planning obligations in this Deed shall be binding on the Site and that the security of the respective charges over the Site shall take effect subject to this Deed Provided that the First Chargee and the Second Chargee (as applicable) shall only be liable for any breach occurring whilst chargee in possession and shall not be liable for any pre-existing breach

7. **DISPUTES**

7.1 In the event of any dispute or difference arising between the Parties in respect of any matter contained in this Deed the matter in dispute may be referred to an independent person (the "Expert") for determination in accordance with the following provisions:

7.1.1 the Expert shall have at least 10 years post qualification experience in the subject matter of the dispute;

7.1.2 where such dispute relates to engineering construction or highway works it shall be referred to a Chartered Civil Engineer agreed upon by the parties or in default of agreement appointed on the application of either party by or at the direction of the President for the time being of the Institution of Civil Engineers;

7.1.3 where such dispute relates to the valuation of property it shall be referred to a Chartered Surveyor agreed upon by the parties or in default of agreement appointed on the application of either party by or at the direction of the President for the time being of the Royal Institution of Chartered Surveyors; and

7.1.4 where such dispute relates to planning and related matters it shall be referred to a chartered town planner agreed upon by the parties or in default of agreement appointed on the application of either party or at the

direction of the President for the time being of the Royal Town Planning Institute;

PROVIDED THAT the parties may otherwise agree an alternative Expert appropriate to the nature of the dispute.

7.1.5 The Expert shall follow the following procedures which shall form part of the terms of his appointment:

- (a) Upon his appointment he shall serve written notice on the parties
- (b) He shall act as an expert and not an arbitrator
- (c) He shall invite written representations on behalf of the person making the reference to him inviting such representations within 21 days of his appointment
- (d) He shall give the other party to the dispute a further 21 days to respond to any representations duly made under Clause 7.1.5 (c)
- (e) He shall then give the parties 14 days to make final submissions to him in writing
- (f) He shall have unfettered discretion to determine the reference to him and shall give reasons for his decision
- (g) His determination including any decision as to the payment of his own costs and those of the parties shall be final and binding on the parties and shall be made within 21 days of the receipt of the representations in Sub-Clauses 7.1.5 (c) to (e) above or the expiry of the 14 day period under Sub-Clause 7.1.5 (e) without any such representations being received.
- (h) His fees and expenses shall be paid initially by the person making the reference to him but he may in making his determination require such payments on account of his fees to be reimbursed in whole or in part by the other party should he determine that the other party should be responsible for his fees.

8. OWNERS' COVENANTS

Unless otherwise agreed in writing by the County Council acting in its absolute discretion and Subject always to the provisions of Clauses 2 and 3 the Owners for

themselves and their successors in title to the Site and each and every part of it and with the intention of binding the Site and each and every part and into whosoever hands the same may come hereby severally covenant with the County Council in respect of the Site as follows:

8.1 Notice of Intention to Commence Development

Prior to Commencement of the Development it shall serve on the County Council a Notice of Intention to Commence Development

8.2 Fire Hydrants

Prior to construction of any Dwelling to submit to the County Council for the County Council's approval (such approval not to be unreasonably withheld or delayed) a proposal for the location and installation of two fire hydrants in accordance with the West Sussex Fire Brigade Guidance Notes attached to this Agreement at Schedule 8 and prior to First Occupation of any Dwelling forming part of the Development that they will at their own expense install the first of such fire hydrants in the approved location with the second being installed at a time to be agreed with the County Council following consultation with and taking account of the requirements of the West Sussex Fire Brigade and in both cases arrange for their connection to a water supply which is appropriate in terms of both pressure and volume for the purposes of fire fighting

8.3 Travel Plan

8.3.1 Not Occupy any Dwelling until a Travel Plan Coordinator shall have been nominated by the First Owner and his or her contact details shall have been notified to the County Council (and for the avoidance of doubt such individual may be a member of the developer's staff and may also do other work)

8.3.2 To ensure that a nominated Travel Plan Coordinator remains in post until the Completion of the Development

8.3.3 To notify the County Council of any changes in the identity and contact details of the Travel Plan Coordinator during the Travel Plan Period

8.3.4 To ensure that the Travel Plan Coordinator performs or procures the performance of the Essential Travel Plan Obligations in accordance with the terms of the Travel Plan and where not specified in the Travel Plan itself a time table approved by the County Council which time table shall start with the Commencement and end on the Completion of the Development (being the end of the Travel Plan Period) Provided always that the total liability of the Owners under this clause 8.3 to expend monies and carry out works in relation to the Travel Plan and Performance of the Essential Travel Plan Measures shall be capped at £50,000 plus indexation under Clause 4 and no more

- 8.3.5 To ensure that the First Owner's promotional material draws the Travel Plan to the attention of all first purchasers tenants and occupiers of the Development
- 8.3.6 To promote the objectives contained in the Travel Plan in its promotional material throughout the construction and sales period of the Development
- 8.3.7 To ensure that all new households within the Development are provided with a residents travel pack which sets out information about public transport in the locality and alternative modes of transport based on the form of travel pack included in the residential travel plan
- 8.3.8 To perform the Essential Travel Plan Obligations the First Owner shall use its reasonable endeavours to achieve the other objectives set out in any approved Travel Plan for the Travel Plan Period

8.4 Education

8.4.1 Primary School and Early Years Facility Provision

- (a) Prior to Occupation of more than 25 Dwellings to submit for the County Council's approval in writing the Primary School Scheme
- (b) The County Council hereby agrees with the First Owner to use its reasonable endeavours to determine approval of or otherwise provide constructive comments and feedback on any Primary School Scheme submission within 20 working days following receipt.
- (c) The First Owner and the County Council shall use their reasonable endeavours to agree the content of the Primary School Scheme (both before and after submission) as soon as reasonably practicable and both parties shall cooperate with each other and provide such assistance as may be necessary to obtain any consents required for delivery of the Primary School
- (d) The First Owner shall use its reasonable endeavours to obtain all necessary consents to deliver the Primary School in accordance with the approved Primary School Scheme and subject to obtaining those consents shall execute the works with the intention that the Primary School shall be ready for operational use for the start of the new primary school year in September 2018 and to that end shall use reasonable endeavours to commence the works not later than the 1st September 2017 (on the basis that the Primary School construction contract is to be subject to a contingency allowance period of 10 weeks) and shall report on a monthly basis to the County Council on progress and shall identify any reasons why the delivery of the Primary School is not on programme together with

the steps which are to be taken to rectify the situation.

- (e) Subject to paragraph (f) not to Occupy more than 600 Dwellings until:
 - (i) The Primary School has been constructed in accordance with the approved Primary School Scheme and Fitted Out as evidenced by the issue of a certificate by the contract administrator appointed under the Primary School construction contract;
 - (ii) The Primary School is Serviced;
 - (iii) A transfer of the Primary School Site (in a form that has been agreed by the Owner and the County Council) duly executed on behalf of the Owner has been unconditionally released to the County Council for completion

Provided That should all the events at sub-paragraphs (e) (i) to (iii) have occurred and the County Council has not completed the transfer referred to at sub-paragraph (e) (iii) within 15 working days of its receipt then the restriction on Occupation of this paragraph (e) shall cease to apply

- (f) The number of Dwellings that may be Occupied for the purposes of the restriction on Occupation at paragraph (e) shall be subject to such extension(s) as may be agreed between the First Owner and the County Council having regard to any delay to the delivery of the Primary School which is not the fault of or has been caused by the First Owner and in the event that any unreasonable delay has been caused by the County Council then the First Owner shall be entitled to invoke the provisions of Clause 7 (Disputes) to seek a determination of any extension and the County Council hereby acknowledges that the restriction at paragraph (e) above shall be enforceable as amended by such a determination
- (g) The transfer of the Primary School Site to the County Council shall be for a consideration of £1.00 and shall be subject to a restriction that the Primary School Site shall only be used for purposes reasonably associated with an educational facility for primary and early years age children.
- (h) The County Council acknowledges that the First Owner has committed to provide the Primary School pursuant to Section 106 of the Act to create child places for primary education and early years learning in mitigation of the impacts arising from the residents of the Development on those education services and the County Council covenants with the First Owner as follows:

- (i) That it shall seek to ensure as part of the school operator selection process that the potential school operators are aware of the expectation of both the First Owner and the County Council that the admissions policy/catchment area for the Primary School shall include the entire Development
- (ii) That prior to the final selection of the school operator it shall consult with the First Owner on the identity of the school operator and the proposed admissions policy/catchment area for the Primary School
- (iii) That it shall work with the selected school operator to ensure that the Development is entirely within the initial admissions policy/ catchment area for the Primary School

PROVIDED ALWAYS THAT the County Council shall not be required to fetter any discretion in the exercise of its statutory duty as the education authority and it is recognised that the school operator will have the final decision as to the admission policy/catchment area for the Primary School.

8.4.2 **Secondary School Contribution**

- (a) To pay the First Secondary School Contribution to the County Council in 12 equal monthly instalments starting 28 days from the later of Occupation of the One Thousand Two Hundred and Ninth (1209th) Qualifying Dwelling to be Occupied or the letting of the main contract for the construction of the main contract for the construction of the Stage 1 Secondary School Extension Works
- (b) To pay the Second Secondary School Contribution to the County Council in 12 equal instalments starting 28 days from the later of Occupation of the One Thousand Seven Hundred and Ninth (1709th) Qualifying Dwelling to be Occupied or if later the letting of the main contract for the construction of the Stage 2 Secondary School Extension Works

PROVIDED ALWAYS THAT the Owner shall be under no obligation to make any such payment to the County Council unless:

- (i) The County Council shall have consulted the First Owner in writing with regard to which secondary school(s) are to be subject to the Stage 1 or Stage 2 Secondary School Extension Works (allowing the First Owner a reasonable time within which to respond in writing) and the County Council shall have had proper regard to the First Owner's consultation responses

before making any final decision on the identity of those secondary schools

- (ii) Notice of Intended Construction of the Stage 1 or Stage 2 Secondary School Works (as appropriate) shall have been duly served upon the First Owner in accordance with the terms of this Deed and
- (iii) The necessary Determination by a Determining Authority or in accordance with such other procedure as the DfE may establish for the Stage 1 or Stage 2 Secondary School Extension Works (as appropriate) shall have been made

8.4.3 Resources Centre Contribution

Unless by the date of letting a contract for the construction of the Community Building the County Council the District Council and the First Owner shall (acting in each case in their absolute discretion) have agreed in writing that the First Owner may construct a Resources Centre within the Community Building and that the County and District Council shall have agreed the terms of any sub lease (which shall be for a minimum of sixty years at a peppercorn rental) the Owners shall upon Occupation of the One thousand One Hundred and Ninth (1109th) Qualifying Dwelling to be Occupied pay the Resources Centre Contribution to the County Council

8.4.4 Passenger Transport Provision

Subject to the agreement of Metrobus or another bus provider approved by the County Council and the provisions of Schedule 4 the Owner shall procure the provision of the Bus Services to the Site in accordance with Schedule 4

8.5 Reservation of Land within the Development

8.5.1 Land shall be reserved and set aside within the Neighbourhood Centre for the following uses:

- (a) The Primary School Site shall be reserved for the Primary School
- (b) The School Extension Land shall be reserved for the extension of the Primary School to three forms of entry Primary School

8.5.2 If by Occupation of the Eight Hundred and Ninth (809th) Qualifying Dwelling Notice of Intended Construction of the Primary School Extension Works shall have been served then no more than Eight Hundred and Fifty Nine (859) Qualifying Dwellings shall be Occupied until the Primary School Extension Site Option shall have been granted

8.5.3 If by Occupation of the Eight Hundred and Ninth (809th) Qualifying Dwelling no Notice of Intended Construction of the Primary School Extension Works shall have been served then the reservation of the School Extension Land shall lapse and the land may be used instead for residential purposes

PROVIDED ALWAYS THAT Nothing shall prevent the use of the land so reserved for other temporary purposes pending its application to the purposes for which it is hereby reserved or for construction and laying of services and service media

8.6 Highway Contributions

The Owner shall make the Contributions to the County Council identified in column 1 of the Payment Table towards the objects identified in column 2 of the Payment Table at the trigger points identified in column 3 of the Payment Table Index Linked in accordance with column 4 of the Payment Table

8.7 Highway Works

Subject always to the County Council having granted/secured all necessary rights and authorities for the works to be carried out (including any necessary traffic regulation orders) to procure the construction of the item of highway works in column 1 to the standard or stage referred to in column 2 by the trigger point referred to in column 3 of the following table (with the Owners having the right to elect (by serving notice in writing to that effect on the County Council) whether to pursue Option A or Option B in relation to the main access works and the secondary access):

Column 1	Column 2	Column 3
Item of Highway Work	Stage of Completion	Trigger Point
1. The construction of the Main Access Works ¹ and Secondary Access Works on the A264	<p>Option A. The main roundabout access and 30 metres of access road to be completed to wearing course level together with all necessary lining and signage</p> <p>The secondary traffic signalised access and 30 metres of access road completed to wearing course level together with all necessary lining and signage</p>	<p>1st Dwelling Occupation</p> <p>9th Dwelling Occupation</p>

¹ Any highway landscaping may be completed in the first planting season following the relevant trigger point and the works shall be deemed complete and for the purpose of this Clause 7.7 the completion of the related highway landscaping shall not restrict Dwelling occupations.

Column 1	Column 2	Column 3
Item of Highway Work	Stage of Completion	Trigger Point
2. Internal Link Road (between Phase 1 and the Neighbourhood Centre)	<p>A. Completed to base course level</p> <p>B. Completed to wearing course level with all necessary lining and signing</p>	<p>Prior to beneficial occupation of any building within the Neighbourhood Centre other than a sales centre or any utilities statutory undertakers or service providers buildings</p> <p>By 459 Dwelling Occupations</p>
3.1 A permanent footpath/cycle path connection from the Site forming a part of the proposed bus gate leading to Sullivan Drive including new bridge across Spruce Hill Brook in order to provide for access from the Site to Bewbush (permanent arrangement) as shown for the purposes of identification only on plan 16702-031 Rev B	To wearing course level	To Sullivan Drive by the 609 th Dwelling Occupation
3.2 A permanent footpath/cycle connection from the Site forming part of the proposed bus gate and connecting with the	To wearing course level	To Woodcroft Road by the 1359 th Dwelling Occupation

Column 1	Column 2	Column 3
Item of Highway Work	Stage of Completion	Trigger Point
existing footpath leading to Woodcroft Road in order to provide for access to Ifield West (permanent arrangement) as shown for the purposes of identification on plan 16702-037 Rev B		
4. Cheals Junction Stage 1 works	Completed to wearing course level	By 9 th Dwelling Occupation unless otherwise agreed in writing with the County Council
5. A264 Highway landscaping	To be completed within 12 months of the A264 highway works being completed	First Owner's landscape contractor to maintain for 12 years and a commuted sum of £20,000 to be paid to WSCC to cover the next 13 years.

8.8 All estate roads within the Development that are on or before implementation of Reserved Matters Approvals identified by the Owner (by reference to a submitted plan) to be privately maintained by the Owner or any estate management company on or before the Reserved Matters Submission for the phase in which those estate roads are situated shall be:

8.8.1 constructed to adoption standard (but recognising that some carriageways may, by agreement with the County Council, be less than the standard width or subject to such other modifications or relaxations as may be agreed by the County Council) to include checking of the drawings and monitoring of the works for which a design check and inspection fee will be required to be paid to the County Council; and

8.8.2 maintained fit for purpose by the Owner or its successors to the land in question or an estate management company in good and substantial repair and condition; and

8.8.3 shall not be dedicated by the Owner or its successors in title or any estate management company as a public highway or become a street (as defined in the New Roads and Street Works Act 1991) without the prior approval in writing of the County Council

8.9 If Monitoring demonstrates the need for improvements to the Sullivan Drive A264

Junction as a result of the Development at any time between Occupation of the 860th Dwelling and Occupation of the 2209th Dwelling then the Owners shall pay the Sullivan Drive Contribution to the County Council towards the upgrade of Sullivan Drive and its junction with the A264 as described at item 4 of Schedule 6

8.10 If Monitoring demonstrates that there is no need for improvements to the Sullivan Drive A264 Junction as a result of the Development at any time between Occupation of the 860th Dwelling and Occupation of the 1809th Dwelling then the Owners shall instead pay the Sullivan Drive Contribution to the County Council towards the provision of additional school places for sixth form children from the Development upon Occupation of the 1859th Dwelling

8.11 To pay the reasonable and proper legal costs of the County Council in the sum of One Thousand Pounds (£1,000) relating to the negotiation and completion of this Agreement prior to its completion

9. COUNTY COUNCIL COVENANTS

In consideration of the covenants and obligations given in this Deed by the Owners the County Council for itself and any successor to its statutory powers hereby covenants with the Owners to observe and perform and comply with the obligations contained in Schedule 3 and to act in good faith and cooperate with the Owners in relation to the matters referred to in this Deed and wherever necessary and appropriate (but subject always to the provisions of Sub-Clause 10.1.2) to use its statutory powers to assist in bringing forward the Highway Works the Primary School and other matters referred to in this Deed in a timely fashion

10. DECLARATIONS

10.1 It is hereby agreed and declared that:

10.1.1 nothing in this Deed shall prevent or remove the absolute right (which right may be reserved in any transfer or other disposition of land comprised in the Site) of the Owner and any successor in title to construct erect build lay re-lay maintain repair replace renew cleanse divert improve extend up-size connect to and use any Infrastructure (whether existing or proposed) in on under or over any part of the Site or other land the subject of this Deed whether existing adopted or constructed laid re-laid or replaced within eighty years of the date of this Deed PROVIDED THAT in exercising such rights the Owner shall cause as little disturbance or damage as reasonably practicable and on completion of any such operations shall so far as possible and having regard to any requirements in relation to ongoing repair and maintenance thereof shall so far as possible make good any damage caused to the land and return the same to a condition fit for its intended purpose

10.1.2 nothing in this Deed shall fetter the discretion of the District Council and the County Council to determine any subsequent planning application and

nothing in this Deed shall prevent or preclude the implementation of any future planning permission and in the event of any conflict or inconsistency between the terms of this Deed and any subsequent planning permission or related planning obligation then the latter shall prevail

10.1.3 if any provision in this Agreement shall in whole or in part be held to any extent to be illegal, ultra vires or unenforceable under any enactment or rule of law, such provisions shall to the extent required be severed from this Agreement and rendered ineffective as far as possible without modifying the remaining provisions of this Agreement and shall not in any way affect any other circumstances or the validity or enforcement of this Agreement and in the event of any such deletion the parties shall negotiate in good faith in order to agree the terms of a mutually acceptable and satisfactory alternative provision in place of the provision so deleted

10.1.4 in the event that any of the Contributions or any instalment of such Contributions are not paid by the date on which the relevant payment is due under this Agreement the Owners shall pay to the County Council an additional sum being the lesser of index linking from the date for payment to the date of actual payment or interest on such Contribution or instalment at the lesser of rate of 2 (two) per centum per annum above the base lending rate for the time being in force of HSBC Bank plc or such other London clearing bank as the County Council may specify for the period from the date on which the relevant contribution is due to be paid up to and including the date of payment of the Contribution or instalment

10.2 **Primacy of Reserved Matters Approvals**

Wherever there is any inconsistency between the Master Plan and Reserved Matters Approvals the latter shall prevail

11. **NOTICES**

11.1 All approvals or authorities demands invoices information or notices and other documents or acts authorised or required by or under this Deed by either the Owners or the District or County Council shall be in writing

11.2 Where any document is required to be delivered to the County Council it shall be addressed to the Head of Legal and Democratic Services or other such officer of the Council as the County Council may from time to time notify the Owners at the address given in this Deed or such other addresses as may be notified to them by the County Council from time to time

11.3 Where any document is required to be delivered to the Owners, it shall be sent by Recorded Delivery AR service addressed to them at the addresses given in this Deed or such other addresses as may be notified to them by the County Council from time to time or to such other person as the Owner may direct and any such document shall only be deemed delivered when receipt thereof is acknowledged

12.

COUNTERPARTS

The Parties agree that this Deed may be completed by executed counterparts

SCHEDULE 1

PRIMARY SCHOOL EXTENSION SITE OPTION

DATED _____ 20[]

[.....] (1)

- and -

The County Council of West Sussex (2)

OPTION AGREEMENT

relating to the sale and purchase of
a site for a Primary School at
Kilnwood Vale
West Sussex

DAVIES ARNOLD COOPER

6-8 Bouverie Street
London EC4Y 8DD

T 020 7936 2222
F 020 7936 2020
www.dac.co.uk

Ref: 1014.413

Vendor provided that any land so designated lies within 800 metres of any boundary of the land shown edged blue on the Plan

"Services and Services Media"

means gas water (either hot or cold) electricity heat foul and surface water television telephones and telecommunications signals waves and pulses whether in each such case the property of a statutory undertaker public or private utility television or telecommunications company body service provider or otherwise pipes wires cables and any related supports poles pylons stays or other ancillary or related plant equipment machinery apparatus structures and buildings ducts conduits drains sewers dykes ponds ditches streams watercourses land drains or other conducting media together with any rights easements wayleaves or licences plant and equipment relating thereto or required therefor or any other equipment or any other services and conducting media (or any wayleaves adoption agreements rights easements or licences relating to any of the above)

"Transfer"

The transfer of the Option Land or the Extension Land (as applicable) to the Purchaser pursuant to this Agreement

- 1.2 Save where the context so admits expressions in this Agreement shall have the same meanings as those given to them by the Principal Agreement
- 1.3 References to statutes bye-laws regulations orders and delegated legislation shall include any statute bye-law regulation order or delegated legislation re-enacting or made pursuant to the same
- 1.4 Words denoting the singular number only shall include the plural and vice versa and words denoting the masculine gender shall be deemed to include (as appropriate) the feminine and neuter genders and vice versa
- 1.5 Unless the context otherwise requires references to any Clause Sub-Clause Schedule or Annexure is to a clause sub-clause schedule or annexure of or to this Agreement
- 1.6 The headings in this Agreement are inserted for convenience only and shall not affect its construction

2 Statutory Authority

This Agreement is made pursuant to Section 111 of the Local Government Act 1972 the Education Act 1944 and all other enabling powers of the Purchaser as the County Council of West Sussex

3 Sale and Purchase of the Option Land

3.1 In consideration of the Option Price the Vendor hereby grants the Purchaser the option to purchase the Option Land and the Extension Land on the terms set out in this Agreement.

3.2 The right of the Purchaser to purchase and the obligation on the Vendor to sell the Option Land shall be conditional upon the service of an Option Notice by the Purchaser within the Option Period (time being of the essence)

3.3 The right of the Purchaser to purchase and the obligation on the Vendor to sell the Option Extension Land shall be conditional upon the service of an Extension Land Option Notice by the Purchaser within the Extension Land Option Period (time being of the essence)

3.4 The Purchaser shall only be entitled to serve:

3.4.1 an Option Notice within the Option Period; and

3.4.2 an Extension Land Option Notice within the Extension Land Option Period

3.5 Completion of the sale and purchase of the Option Land shall take place on the Completion Date and of the Extension Land on the Extension Land Completion Date

3.6 Where:

3.6.1 the Option Period expires without the Purchaser serving an Option Notice; or

3.6.2 the Vendor serves notice on the Purchaser exercising its Buy-Back Option pursuant to clause 7.2; or

3.6.3 the Purchaser serves notice pursuant to clause 4; or

3.6.4 the Purchaser's Notice of Construction of the Stage 2 Primary School Works relates to an extension to the Primary School to form only a two or a two and a half form entry primary school; or

3.6.5 the Purchaser does not serve a Notice of Intended Construction of the Stage 2 Primary School Works by the date on which the 1600th Qualifying Dwelling shall have been occupied

then the Purchaser's right to exercise its option in respect of the Extension Land shall immediately be null, void and of no further effect

3.7 For the avoidance of doubt under no circumstances shall the Purchaser serve a Notice of Intended Construction in relation to the Stage 2 Primary School Works before it serves such notice in relation to the Stage 1 Primary School Works nor shall a situation validly arise whereby either the Transfer of the Extension Land takes place prior to the Transfer of the Option Land or the Purchaser owns the Extension Land but not the Option Land

4 Determination of the Agreement

If at any time prior to the expiry of the Option Period the Purchaser shall notify the Vendor in writing that it no longer requires the Option Land then upon such notification being given:

4.1 this Agreement shall automatically determine; and

4.2 the Vendor shall have unrestricted use and enjoyment of the Option Land and the Extension Land; and

4.3 the Purchaser shall cancel any registration at the Land Registry which has been registered to protect this Agreement

and if at any time prior to the expiry of the Extension Land Option Period the Purchaser shall notify the Vendor in writing that it no longer requires the Extension Land then upon such notification being given

4.4 this Agreement shall automatically determine in so far as it relates to the Extension Land option; and

4.5 the Vendor shall have unrestricted use and enjoyment of the Extension Land; and

4.6 the Purchaser shall cancel any registration at the Land Registry which has been registered to protect this Agreement in so far as it relates to the Extension Land

5 Conditions of Sale

5.1 The Standard Commercial Property Conditions (2nd Edition) shall be deemed to be incorporated in relation to the options granted by this Agreement so far as not inconsistent with the terms hereof

- 5.2 A good and marketable title to the Option Land and the Extension Land shall be deduced to the reasonable satisfaction of the Purchaser
- 5.3 The Option Land and the Extension Land shall be transferred free from any option mortgage or other financial charge
- 5.4 The Option Land and the Extension Land shall be transferred free from any easement restrictive covenant or other matter which would prevent or unreasonably restrict its beneficial use as a primary school
- 5.5 The Vendor shall sell with full title guarantee
- 5.6 The Purchaser (in this clause 5.6 meaning the County Council of West Sussex) shall not be entitled to assign the benefit of this Agreement nor to require the Vendor to transfer the Option Land or the Extension Land to any person or body other than to the Purchaser except in so far as the statutory regime for the provision of Primary School Education shall have changed in which eventuality the transfer may be to such alternative body as shall have replaced the County Council in that regard
- 5.7 Vacant possession will be given on completion

6 The Transfer

- 6.1 There shall be excepted and reserved from any Transfer of the Option Land and any Transfer of the Extension Land to the Purchaser such of the matters referred to in the First Schedule subject to the proviso to Paragraph 2 of the First Schedule
- 6.2 The Transfer of the Option Land and the Transfer of the Extension Land shall:
- 6.2.1 be subject to the matters contained in the Second Schedule
- 6.2.2 include the covenants contained in the Third Schedule
- 6.2.3 have the benefit of the matters referred to in the Fourth Schedule; and
- 6.2.4 contain a declaration that the provisions of Section 62 of the Law of Property Act 1925 shall not apply

7 Buy Back Option

- 7.1 Each Transfer shall include the grant of an option in favour of *[insert relevant Crest company at date of grant of Option]* or its nominee ("**Buy-Back Option**") to purchase the Option Land or the Extension Land (as applicable) from the Purchaser or its successors in title (in consideration of the payment of £1.00 (one

pound)) with full title guarantee and with vacant possession on completion and free from the covenants, restrictions and obligations contained in this Clause 7 and the Third Schedule but otherwise on the same terms and conditions as those herein stated save for this Clause 7 if:

7.1.1 in relation to the Option Land the Purchaser shall fail to let a contract for the construction of the Stage 1 Primary School Works within the period of five years from the Completion Date or the Purchaser shall fail substantially to commence the construction of the Stage 1 Primary School Works within the period of eight years from the Completion Date

PROVIDED THAT in calculating the said periods specified in Clause 7.1.1 no account shall be taken of periods when such construction or use shall have ceased due to acts of God or acts of the Queen's enemies invasion riot civil commotion inclement weather difficulties or delay experienced in obtaining any requisite labour and/or materials strike industrial dispute or lock-out (whether involving the Purchaser's servants or not) any embargo or prohibition imposed by Act of Parliament or otherwise by any local or public authority force majeure fire storm tempest lightning frost flood earthquake or aircraft or anything dropped therefrom failure of the main contractor through insolvency or any reason beyond the Purchaser's reasonable control

- 7.2 The Buy Back Option may be exercised by the Vendor (here meaning *[insert relevant Crest company at date of grant of Option]* (and not its successors or assigns) serving written Notice of such on the Purchaser
- 7.3 The Option Land and the Extension Land shall each be transferred to the Vendor (here meaning *[insert relevant Crest company at date of grant of Option]* and not its successors in title or assigns) pursuant to the Buy Back Option free of the covenants and restrictions contained in the Transfer and the Schedules hereto with vacant possession and free of the options granted to the Purchaser by this Agreement
- 7.4 The Standard Commercial Property Conditions (2nd Edition) shall apply to the Buy Back Option so far as they are applicable to a sale by private treaty and are not varied by or inconsistent with the terms of this Agreement
- 7.5 The Vendor shall pursuant to the Buy Back Option transfer the Option Land and the Extension Land (as applicable) with full title guarantee

8 General Provisions

8.1 The Purchaser will until such time as the same are declared to be public highways maintainable at public expense make good any damage caused by the Purchaser to the roads and footpaths over which it is granted rights of way in the Transfer

8.2 The Purchaser shall be allowed at any time upon giving 48 hours prior notice in writing to enter upon any part of the Option Land or the Extension Land for the purpose only of inspection or survey or to make boreholes or take samples and plant equipment pegs or marks thereon in locations approved by the Vendor so far as reasonably necessary in connection with the Purchaser's proposed development of the Option Land or the Extension Land the Purchaser hereby causing as little damage and inconvenience as reasonably possible and forthwith making good any damage so caused

9 Condition of the Option Land

9.1 The Vendor shall procure that upon completion of the Transfer of each of the Option Land and the Extension Land, the relevant land is:-

9.1.1 in a reasonable condition having regard to the Purchaser's proposed use of it as a primary school site

9.1.2 a cleared site with all significant tree roots grubbed-out (save where any existing landscape features can be retained as part of the setting of the primary school buildings and grounds)

9.1.3 treated in accordance with any remedial recommendations resulting from a contamination survey conducted by a reputable environmental consultancy and which shall have been carried out at the Vendor's expense prior to completion of the Transfer

10 Value Added Tax

10.1 All consideration given in accordance with the terms of this Agreement shall be exclusive of any VAT properly payable in respect thereof

10.2 If at any time VAT becomes chargeable in respect of any supply made in accordance with the terms of this Agreement then to the extent that VAT has not previously been charged in respect of that supply the person making the supply shall have the right to issue a VAT invoice to the person to whom the supply was made and the VAT shall be paid accordingly

11 Registration

- 11.1 The parties hereto agree that the Purchaser shall be entitled to register this Agreement against title(s) number(s) [] and shall take all necessary steps to assist the Purchaser with the relevant application(s)
- 11.2 The parties hereto apply to the Chief Land Registrar to enter a note of this Agreement against title(s) number(s) []

12 Disputes

- 12.1 Wherever in this Agreement the consent agreement or approval of any party shall be required the same shall not be unreasonably withheld or delayed
- 12.2 In this Agreement where any matter or question of value falls to be agreed between the parties or a test of reasonableness falls to be applied or determined in respect of any matter or a dispute shall arise in respect of any matter then failing the resolution of any such dispute disagreement or difference within twenty working days of the same arising it may be referred for determination in accordance with the provisions of Sub-Clause 12.3 on the reference of either of the parties hereto
- 12.3 Any such dispute disagreement question or difference shall be referred to the decision of a single expert qualified to deal with the subject matter of the dispute disagreement or difference who shall either be jointly nominated by the parties within a period of ten working days of reference under Sub-Clause 12.2 or failing agreement on such nomination the expert (who must also be prepared to abide by the terms of reference in sub-clause 12.5) shall be nominated by the President for the time being of the Royal Institution of Chartered Surveyors (or in his absence the Vice President or anyone appointed by the President) and in any question of value shall be decided by a Chartered Surveyor of at least 10 years experience
- 12.4 The expert's determination (including any determination as to the responsibility for payment of his own costs and those of the parties) shall be final and binding upon the parties save in the case of manifest error
- 12.5 The terms of reference of any expert appointed to determine a dispute shall include the following:-
- 12.5.1 he shall act as an expert and not an arbitrator
- 12.5.2 he shall call for and consider any written representations made by or on behalf of the parties which are received by him within twenty working days of his calling for such representations and at the expiry of this period shall give the parties a further period of fifteen working days to make counter-representations

12.5.3 he shall provide the parties with a written decision (including his reasons) within twenty working days of the last date for receipt of counter-representations under sub-paragraph 12.5.2 of this Sub-Clause

12.5.4 he shall be entitled to call for such independent expert advice as he shall think fit

12.5.5 he shall be entitled to determine which of the parties shall pay his costs and the costs of any independent expert advice called for by the expert or the proportion each shall pay

13 Notices etc.

Any notice hereunder shall be in writing and shall be sent by hand or by recorded or registered delivery post:

13.1 to the Vendor [care of Messrs _____ for the attention of _____] or to such other agent in the Option Land and the Extension Land as the Vendor shall from time to time specify by notice in writing to the Purchaser and

13.2 to the Purchaser at its address above stated and marked [_____]

and shall be deemed to be given or served in the case of a notice delivered by recorded or registered delivery post or by hand upon delivery (or where not delivered on a working day then at 9.00 am on the following working day)

14 Execution

None of this document shall take effect until this document has been executed by all parties hereto and dated

IN WITNESS whereof the parties hereto have executed this document as a Deed

FIRST SCHEDULE

EXCEPTIONS AND RESERVATIONS

The following shall be excepted and reserved from the Transfers of the Option Land and the Extension Land for the benefit of the Retained Land and each and every part thereof and of the Vendor and its successors in title the owners and occupiers for the time being of the Retained Land and persons authorised by them:

1 The rights to:-

- 1.1 enter on the Option Land or the Extension Land (as applicable) to carry out works of planting and landscaping on adjoining Retained Land and to construct repair lay cleanse divert and connect to and use any Services and Service Media constructed now or within the Perpetuity Period in on under or over the Option Land or the Extension Land (as applicable)

in each case causing as little damage and inconvenience as reasonably practicable and forthwith making good any damage so caused to the reasonable satisfaction of the Purchaser

- 2 Any rights of light and air which might prejudicially affect the development and use of the Retained Land or any part thereof for building or any other purpose and it is hereby declared that the Purchaser and its successors in title shall not become entitled to any such rights for the benefit of the Option Land or the Extension Land save such as are necessary for the development and use of such land as a primary school

- 3 The right of support for the benefit of the Retained Land and each and every part thereof and any buildings now or within the Perpetuity Period constructed thereon

THE SECOND SCHEDULE

The Transfer of the Option Land and the Transfer of the Extension Land to the Purchaser pursuant to this agreement shall be subject to the following matters in so far as the same shall burden the Option Land or the Extension Land (as applicable) or benefit the Retained Land:

- 1 any matters other than financial charges referred to or contained in the property and charges registers of title numbers [.....]
- 2 all matters registrable by any competent authority pursuant to statute;
- 3 all requirements of any competent authority;
- 4 all rights of soil, water, drainage, light, air, support and other easements and quasi or reputed easements, covenants, rights and/or restrictions in favour of the Retained Land or of adjoining neighbouring or nearby persons land or property
- 5 all charges, drainage rates and other outgoings and liabilities as may now affect or be charged upon the Option Land or Extension Land (as applicable) or any part of it as well as the usual outgoings
- 6 overriding interests as defined in the Land Registration Act 1925 Section 70(1)
- 7 all matters disclosed or reasonably to be expected to be disclosed by searches or as the result of enquiries of any competent authority and whether made in person, by writing or orally by or for the Vendor or which a prudent purchaser ought to make without any obligation on the part of the Vendor to define the same and the Purchaser shall not raise any enquiry on, or objection or requisition in respect of such matters

In this schedule:

"competent authority" means a local authority governmental regulatory or other body exercising powers under statute or by Royal Charter; and

"requirement" includes (whether or not subject to confirmation) any notice award directive order or proposal.

THIRD SCHEDULE

Purchaser's Covenants

1 The Purchaser hereby covenants with the Vendor so as to benefit each and every part of the Retained Land and so as to bind the Option Land (which in this Schedule shall be interpreted as meaning "Option Land or Extension Land (as applicable)" and each and every part thereof into whosoever's hands the same may come:

1.1 not without the consent of Crest *[insert relevant Crest company]*

1.1.1 for a period running from the date of transfer of the Option Land to the Purchaser to the date 20 years after the date of opening of the Stage 1 Primary School Works to cause or permit the Option Land to be used otherwise than as a state maintained primary school (with reference to the Stage 1 Primary School Works to be interpreted as a reference to the Stage 2 Primary School Works in relation to the Extension Land)

1.1.2 to dispose of

1.1.2.1 the Option Land during the respective 20 year periods referred to in paragraph 1.1.1

1.1.2.2 any part (as opposed to the whole) of the Option Land for a further 10 year period beyond the respective 20 year periods referred to (with reference to part of the Option Land meaning any part of the combined Option Land and Extension Land where both options have been exercised); and

1.1.2.3 the whole of the Option Land for the further 10 year period aforementioned unless all the proceeds of sale of the disposal transaction are simultaneously invested in a new primary education facility which is within sufficient proximity to the Kilnwood Vale development for it to be reasonable for children living on it to attend the new facility

1.1.3 to use cause or permit the use of the Option Land for any commercial purpose or to charge any fee or entrance charge for entering or using the land during the period of 20 years referred to in paragraph 1.1 above unless such relates to the use of the Option Land as a state maintained primary school or is for the raising of funds to assist in supporting the facility and is in any event ancillary to the operation of the facility

- 1.1.4 to cause or permit any building structure landscaping or works on the Option Land to obstruct or interfere with any sight lines or visibility splays required within the Perpetuity Period by the local planning or highways authorities (whether under planning permission reference [.....] or otherwise) in respect of the redevelopment of the Retained Land or with any rights or entitlements to light air and support in favour of the Retained Land and/or any buildings erected on the Retained Land now or within the Perpetuity Period PROVIDED that no such restriction shall apply to the first construction of the Primary School
- 1.1.5 to cause or permit any trees or shrubs to be planted on the Option Land within four metres of any Services and Service Media or to become a danger or a nuisance to any persons or property
- 1.1.6 to do or suffer to be done anything which might cause damage to or diminish the value of the Retained Land or any premises erected on the Retained Land or any part or parts thereof or adversely effect the residential amenities of the occupiers of any dwellings now or to be constructed or within the Perpetuity Period thereon provided that the construction and use of a Primary School and ancillary uses on the Option Land shall not be deemed to diminish the value of the Retained Land or any premises erected thereon
- 1.1.7 to dispose of any interest in the Option Land or in any part thereof without first obtaining from the disponee and delivering to the Vendor (here meaning Crest [] - not its successors in title) a duly executed and completed deed of covenant made directly with the Vendor to observe the covenants herein contained including this covenant insofar as they relate to the part or the whole of the Option Land to be disposed of
- 1.2 on receipt of a request in writing from the Vendor (and subject to receiving an indemnity against any costs and liabilities relating to the conclusion of such agreements) promptly to grant or enter into any necessary agreements and/or grant any right pursuant to any other statutory provision or as otherwise specified in the said request in relation to the reservation construction laying out adoption and subsequent use replacement repair and maintenance of any Services and Service Media or sight lines reserved constructed or laid out or subsequently to be reserved constructed or laid out in on under or over the Option Land or any part thereof at any time prior to the expiry of the Perpetuity Period
- 1.3 to fully and effectively indemnify the Vendor (here meaning Crest []) against any legitimate claims costs demands or proceedings arising from any breach or non-

observance of any covenants or conditions affecting the Option Land at the date hereof during the Purchaser's ownership

1.4 to maintain or procure the maintenance of the Option Land in a condition suitable for its intended use

1.5 to comply with:-

1.5.1 the provisions and conditions of any planning permission relating to the Option Land

1.5.2 any covenants and obligations which bind the Option Land pursuant to Section 106 of the Town and Country Planning Act 1990; and

1.5.3 the provisions of any agreement entered into pursuant to paragraph 1.2 above

FOURTH SCHEDULE

Benefits in favour of the Option Land

- 1 The Transfer shall include the grant to the Purchaser, in common with the Vendor and those authorised by it and all or any successors in title or the owners and occupiers for the time being of the Option Land (or the Extension Land, where applicable), the right
 - 1.1 to use such roads and Service Media as the Vendor shall identify acting reasonably to enable the Option Land or Extension Land (as applicable) to be accessed from the adopted highway network and Serviced such right to subsist pending their adoption or being taken over by the relevant authority utility company or service provider
 - 1.2 Rights of support for each and every part of the Option Land or Extension Land (as applicable) and any buildings now or in the Perpetuity Period constructed thereon
 - 1.3 Such rights of light and air for each and every part of the Option Land or Extension Land (as applicable) but only in so far as are necessary for the development and use of the relevant land as a primary school

DATED _____ 20[]

- to -

[CREST COMPANY]

DEED OF COVENANT

relating to Option Land at

(School Site)

DAVIES ARNOLD COOPER

6-8 Bouverie Street
London EC4Y 8DD

T 020 7936 2222
F 020 7936 2020
www.dac.co.uk

Ref: 510/1014.413

SCHEDULE 2

**PART 1
TRAVEL PLAN**

Crest Strategic Projects

Kilnwood Vale

Travel Plan

Project Ref: 16702/008

Doc Ref: R001/rev01

July 2010

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Travel Plan

Document Control Sheet

Project Name: Kilnwood Vale
Project Ref: 16702/008
Report Title: Travel Plan
Doc Ref: R001/rev01
Date: July 2010

	Name	Position	Signature	Date
Prepared by:	James Brooke	Transport Planner		
Reviewed by:	Sarah Matthews	Senior Associate		
Approved by:	Bob Pinkett	Partner		
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
A	20/05/11	Update in response to WSCC comments 13.12.10	CB	SM	BP
B	27/07/11	Update in response to WSCC comments in various emails during July 2011	AL	SM	

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Kilnwood Vale
Travel Plan

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Executive Summary

Introduction

Kilnwood Vale offers a major opportunity to create a new community which has sustainability built into its core. By its location and the real attention to detail in planning the access, layout and infrastructure of the site sustainable travel will be the obvious choice for new residents.

The Travel Plan (TP) outlines:

- the development proposals (consisting of up to 2,650 homes, serviced land for 8,000m² of employment, food store and a range of local facilities and services); and
- the range of opportunities available to further reduce the reliance on single occupancy car journeys.

National and Local Policy

The Travel Plan supports and complies with national and local policies. Information on how the development proposals, design principles, and sustainable transport proposals comply with transport and planning policies are fully explored in the Travel Plan.

Existing Travel Situation and Accessibility

The site is already well served by numerous walk and cycle links. Analysis of accessibility by walk/cycle has been undertaken using Accession, which shows that the site has good access by both walk and cycle to areas of Crawley. The development benefits from local education facilities, shops, GP/Dentists, and Opticians/Pharmacies in Bewbush.

There are also a number of bus services operating in close proximity to the site, including the Fastway Service. There are two stations within 3 km of the site – Ifield Station and Faygate Station.

In terms of the existing highway network, the site lies adjacent and to the north of the A264 and can be reached via the M23 at junction 11. The site lies adjoins Bewbush, a local residential area with a good range of social and community facilities and south west of Ifield West.

Proposals for Improving Accessibility to the Development

The masterplan has been designed to encourage walking and cycling through numerous links (including green segregated routes and shared surfaces) within the site between the key destinations within the site, such as the Market Square and the potential railway station

The proposed bus gates to Bewbush and Ifield West and a bus lane and advance facilities at the main access enables the extension and/or diversion of a number of bus services into the development, including the Fastway Service 10.

There is the opportunity to introduce a new station within the site, as the railway line runs through the northern section of the site. Preliminary design and evaluation has been undertaken to demonstrate that the site could accommodate a new railway station with associated car parking and a multi-modal interchange. Discussions with Network Rail (NR) indicate their support in principle subject to further detailed evaluation.

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Contributions to a number of off-site highway improvements have also been considered within the Transport Assessment in order to mitigate the residual impacts of the development. In addition, it is proposed that the development is served by a primary vehicle access, which is accessed from the A264 and in the form of a roundabout. A secondary access will be provided for left in, left out and right out movements.

Aims and Objectives

The following general objectives are considered to be relevant for the TP and Transport proposals at Kilwood Vale.

- To reduce single occupancy car use to and from the development
- To encourage sustainable communities and neighbourhoods
- To promote healthy living and activity
- To complement strong sustainable urban design elements
- To support national, local planning and transport policies

The targets of the TP have all been determined and assessed using the SMART evaluation criteria, i.e. 'Specific', 'Measurable', 'Achievable', 'Realistic', and 'Time bound'.

The TP aims to secure reductions both daily and peak hour reductions in single occupancy car trips.

The following targets are proposed to achieve the Councils objective of reducing single occupancy car use:

	Phase 3	Phase 4	Completed Development
AM Peak (0800-0900)	828	997	1228
PM Peak 1700-1800)	926	1046	1204
12 Hour (0700-1900)	7866	9162	10906

Table 1: Target Development Vehicle Trips

Measures

The design principles, transport proposals and mitigation measures for the development have been influenced from an early stage by the general objectives and aims of the TP. Residents, employees and visitors to Kilwood Vale will benefit from both 'hard' and 'soft' sustainable measures delivered early in the creation of a new neighbourhood, when new residents are most easily influenced and most likely to change their travel behaviour.

The Travel Plan sets out a wide range of measures proposed for the Kilwood Vale development, including measures that 'reduce the need to travel', 'increase the use of sustainable modes', and 'reduce the impacts of cars'.

The masterplan has been developed to facilitate ease of movement by walking, cycling, bus and rail. A network of foot/cycleways is planned including a priority route, creating a central spine north-south

**Kilnwood Vale
Travel Plan**

through the development. Bus gates will provide direct and priority links into and out of the site for bus services. The possible railway station and car park is located along the central spine close to the mixed use centre. The streets are designed to allow bus services to penetrate the site along routes unobstructed by cars. Streets with higher traffic flows include segregated cycleways and streets with lower flows will be planned to give priority to non-car modes. Traffic calming will be integral to the design of the streets.

This approach is complemented by the provision of a range of 'soft' measures that predominantly aim to further encourage the uptake of sustainable modes by residents, visitors, and employees of the development.

This combination is therefore considered to provide significant potential to positively influence travel behaviour, and offer the optimum opportunity to enable residents, employees, and visitors to travel by sustainable modes, and ensure that they meet the targets identified.

This approach should result in meeting the targets set out in section 6, however, if any of the targets are not met within the specified time period, a number of additional measures can be considered for implementation.

Implementation

The implementation plan includes the following commitments:

- appointment of the Travel Plan Coordinator (TPC);
- establishment of TP forum;
- delivery of proposed TP measures;
- commissioning of surveys and monitoring;
- implementation of Supplementary Enforcement Measures (if required); and
- review of TP performance.

Management and Monitoring

It is proposed that both qualitative and quantitative data should be collected at the development in order to fully understand the travel patterns and behaviour and the effects and benefits of the proposed travel planning measures.

In terms of qualitative data collection, travel surveys will be undertaken upon completion of each phase of the development, to help to understand travel patterns and behaviour from an early stage. It is proposed that quantitative data will be collected in accordance with Table 2. This will comprise TRICS SAM monitoring and/or Automated Traffic Counters (ATCs).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Travel Survey			✓		✓			✓			✓					✓
TRICS								✓			✓					✓
ATC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 2: Monitoring Programme

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Travel Plan

Supplementary Enforcement Measures

Over the course of this monitoring period, the performance of the TP will be assessed against the targets identified. If these targets are met, no further action will be required. However, if it is considered that the targets are not met, then Supplementary Enforcement Measures may be required.

The 'Supplementary Enforcement Hierarchy' approach has been taken, which is set out within the WSCC Development Travel Plan Policy. This encourages the implementation of on-site travel planning measures as a priority.

A number of 'Supplementary Enforcement' measures have therefore been determined which could be implemented, if specific targets are not met. The TPC can select the most appropriate Supplementary Enforcement Measures to help meet the targets.

1 Context

1.1 Introduction

1.1.1. The Kilnwood Vale site offers a major opportunity to create a new community which has sustainability built into its core. By its location and the real attention to detail in planning the access, layout and infrastructure of the site sustainable travel will be obvious choice for new residents. This Travel Plan sets out how influencing attitudes and behaviour are essential in delivering this important site for West Sussex.

1.1.2. The Travel Plan (TP) outlines:

- the development proposals (consisting of up to 2,650 homes, serviced land for 8,000m² of employment, foodstore and a range of local facilities and services)
- the range of opportunities to further reduce the reliance on single occupancy car journeys.

1.1.3. This TP has been prepared in accordance with the Department for Transport's (DfT) 'Making Residential Travel Plans Work' (2005 & 2007), and West Sussex County Council's (WSCC) 'Development Travel Plan Policy' (2009 (unadopted)).

1.1.4. It should also be noted that this TP should be read in conjunction with the Transport Assessment.

1.2 The Site

1.2.1. The development site is situated to the west of Crawley, within the County of West Sussex as indicated in Figure 1. It lies within Horsham District, but is adjacent to Crawley Borough and its urban edge. The site is located approximately 3.5km from Crawley Town Centre (CTC), adjacent to and north of the A264 Crawley Road. The A264 provides public transport and highway links to Crawley town centre, Horsham (12.5 km away), Gatwick Airport, and Manor Royal, the main employment site within the local area.

1.2.2. Part of the site, south of the railway line is currently a landfill operation and its licence was surrendered in December 2008. The remainder of the site is greenfield land.

1.2.3. The surrounding area is rural to the west, and residential to the east, including Ifield West (to the northeast), Bewbush (to the east), and Broadfield (to the southeast). A small industrial estate is also located to the south of the A264.

Kilnwood Vale
Travel Plan

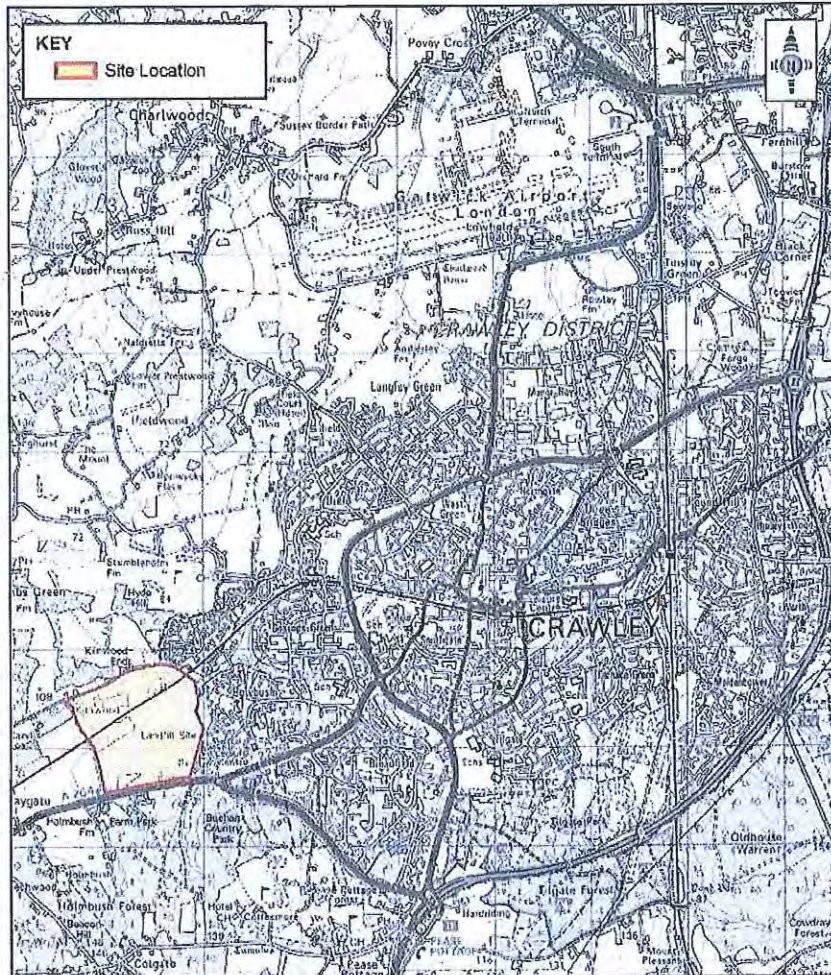


Figure 1 - Site Location

1.3 Development Proposals

1.3.1. The development proposals are as follows:

- 2,650 dwellings (up to 40% of the dwellings being affordable housing) ;
- Serviced land for 8,000m² of employment;
- local foodstore/supermarket of 2,500m² of retail floor area;
- Nursery school facilities;
- Land for primary school facilities up to three forms of entry;
- Land for a primary care centre for a minimum of 3-4 GPs and 700m² GFA;

Kilnwood Vale
Travel Plan

- A community building, including library/internet based resourced facility;
- The potential delivery of a railway station and up to 200 space car park;
- A public house;
- 60 – 80 bed Care Home.

1.3.2. It is anticipated that the construction of the development will commence in 2012 and be fully completed by 2023. The table below shows the indicative phasing of the development.

	Year	No. of Dwellings	Other Uses
Phase 1	2012 - 2015	300	
Phase 2	2014 – 2017	500	Foodstore
Phase 3	2017 – 2020	750	School Employment GP Surgery
Phase 4	2019 – 2021	550	
Phase 5	2021 – 2023	550	
Total		2650	

Table 3: Anticipated Development Phases

1.3.3. Subject to the Council dedicating any necessary land:

- Access for pedestrians and cyclists will be possible at numerous locations around the site.
- Three access points for buses are proposed; a bus gate at Sullivan Drive (Bewbush), a bus gate at Woodcroft Road (Ifield West), and via the main access junction on the A264.
- There may also be opportunity to access the site directly by rail with the introduction of a new railway station.

1.3.4. Vehicular access to the development will be via the A264. The main access will be via a roundabout junction. A secondary signalised access junction will be available. Car access is less direct to/from the development to the main destinations to the east of the development, particularly in comparison to the access options available by other modes of transport. This principle has been agreed through the JAAP, and reflects national, regional and local policy guidance to discourage car use in favour of more sustainable means of transport.

2 National and Local Policy

2.1 Introduction

- 2.1.1. A number of policy documents, which are particularly relevant to development TPs, have been reviewed during the preparation of this TP, in a national and local context. These are discussed below.

2.2 National Policy

Delivering a Sustainable Transport System, 2008

- 2.2.1. Delivering a Sustainable Transport System (DaSTS) sets out the Department of Transport's transport strategy, which builds upon Towards a Sustainable Transport System (TaSTS) (October 2007) and responds to the recommendations made in the Eddington Transport Study and the Stern Review of Economics of Climate Change. The DaSTS outlines goals for the national transport system as follows:

- "To support national economic competitiveness and growth, by delivering reliable and efficient transport networks;
- To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change;
- To contribute to better safety, security and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health;
- To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society; and
- To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment."

- 2.2.2. Therefore a TP would help to secure the DaSTS goals.

Planning Policy Guidance 13: Transport, 2001

- 2.2.3. Planning Policy Guidance 13 (PPG13) advises that new development must be located and designed in ways which both reduce the need to travel and the dependence on the private car. The guidance introduces maximum parking standards rather than the traditional minimum requirements and, particularly in town centres, encourages the shared use of car parking spaces.
- 2.2.4. In addition, further to the Department for Transport's (DfT's) Transport Ten Year Plan 2000, PPG 13 provides advice on how Local Planning Authorities (LPAs) should integrate transport and land use planning. The key aim of the guidance is to ensure that LPAs carry out their land use policies and transport programme in a way that helps to:
- Promote more sustainable transport choices for both people and for moving freight;
 - Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling; and

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- Reduce the need to travel, especially by car.

2.2.5. Particular emphasis is also given in PPG13 to ensure that development sites offer realistic, safe and easy access by a range of transport modes and not exclusively by car. The approach taken within this TP evidently takes this into consideration.

Planning Policy Statement 3: Housing, 2010

2.2.6. Planning Policy Statement 3 (PPS3) emphasises the need for new high density developments to be located in areas with high levels of public transport accessibility. In particular, PPS3 states:

- "Local Planning Authorities should develop housing density policies having regard to ... the current and future levels of accessibility, particularly public transport accessibility".
- In addition, PPS3 states that new high density development should be:
 - "Easily accessible and well-connected to public transport and community facilities and services, and is well laid out so that all the space is used efficiently, is safe, accessible and user-friendly".
 - With regard to parking provision, PPS3 states that new developments should provide a design-led approach to the provision of car parking space that is well integrated, with a high quality public realm and streets that are pedestrian, cycle and vehicle friendly.

Making Residential Travel Plans Work, 2007

2.2.7. Making Residential Travel Plans Work describes the challenge ahead for the transport system, based on the proposals to build approximately 28,000 new homes in the South East of England. As a result minimising the impact on our transport system will be a key challenge. The guidance states that the development will need:

- To take a sustainable design approach which will enable:
 - good access to local services
 - high quality open areas to encourage walking, cycling, and recreational use of public space
 - access to public transport
- But also to provide real incentives so that individuals benefit from changing their travel behaviour and sustain these changes long term.

2.2.8. This document also identifies 'Smarter Choices' as an effective tool in reducing traffic and improving accessibility in residential areas. These can include car clubs, car sharing schemes, travel awareness and individualised marketing campaigns, and measures to reduce the need to travel such as promoting tele-working and video-conferencing.

2.2.9. An effective smarter choices programme over 10 years (as was originally published in the Smarter Choices 2005 report), 'could cut urban peak-hour traffic by 21% and off-peak traffic by 13%. Nationally, traffic volumes could fall by 11%.

2.2.10. In addition, Making Residential Travel Plans Work also discusses the 'Travel Plan Pyramid', which is shown below.

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Figure 2 – Travel Plan Pyramid ('Making Residential Travel Plans Work' DfT 2007)

- 2.2.11. This helps to demonstrate the importance of both hard measures – “such as new bus stops and cycle ways”, and soft measures – “such as discounts on season tickets and help with individual journey planning” (DfT, 2007) in reducing the dependence on car use and encouraging sustainable modes of transport.

Good Practice Guidelines: Delivering Travel Plans through the Planning Process, DfT 2009

- 2.2.12. 'Delivering Travel Plans through the Planning Process' (2009) supersedes the 2002 best practice guidance 'Using the Planning Process to Secure Travel Plans'. This document brings together the key principles and mechanisms that have used to secure effective TPs in England.
- 2.2.13. It includes detailed information on the thresholds for the requirement of TPs and the different types of TPs; their design and content; the evaluation of incoming TPs; securing TPs; the implementation and management of TPs; and the monitoring, default mechanisms and enforcement.
- 2.2.14. Also, importantly, this guidance has also identified through research that, 'it is important to establish sustainable travel behaviour from the beginning, whatever the nature of the development, because changing established patterns of travel is more difficult.' This is a recommendation that has been prioritised within this TP.

Smarter Choices - Changing the Way we Travel, DfT 2005

- 2.2.15. The Smarter Choices document reviewed numerous measures which could be implemented in order to encourage sustainable travel, including work-place TPs, school TPs, personalised TPs, marketing strategies, awareness raising campaigns, tele-working and public transport information.
- 2.2.16. This concluded that a reduction of 21% in peak period urban traffic and 14% in non urban traffic could be achieved through the wide-scale application of these measures.

2.3 Local Policy

West Sussex Local Transport Plan 2006-2016, July 2005

- 2.3.1. The West Sussex Local Transport Plan's (LTP) vision for transport in 2016 is to achieve efficient, safe, less congested transport networks which contribute towards improved quality of life, access to services, jobs and housing, local economy and environment in West Sussex.
- 2.3.2. The County Council recognises that transport can play an important role in achieving a wide range of social, economic and environmental objectives.
- 2.3.3. "In order to make a contribution to these wider objectives the transport objectives for 2016 are to have;
- more accessible services especially for those most in need;
 - less congested roads;
 - transport networks and services which are safer and less polluting; and
 - improved local environments which encourage economic vitality and healthy and sustainable travel, leading to a better quality of life for residents."

WSCC Development Travel Plan Policy (2009 (unadopted))

- 2.3.4. The WSCC Development Travel Plan Policy sets out detailed information on the required thresholds for requiring a TP and the proposed structure and framework. Also included is information on targets, implementation, monitoring, and management. Specifically, the TP seeks to achieve WSCC Travel Plan Policy "to reduce the number of vehicle trips generated over a 12 hour period (weekday 7am-7pm) by the site by a minimum of 15% in urban areas and 10% in rural areas."
- 2.3.5. This document also identifies the numerous benefits of delivering TPs. In particular, benefits to residents, visitors, and the community may include:
- "Improved accessibility, public transport provision and travel choice for reaching local facilities by residents and the local community
 - Enhanced social inclusion for those experiencing accessibility difficulties
 - A sense of community

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- Reduction in the inequalities that may exist between car/non car owners
- Improved understanding of the benefits of not using the car when alternatives exist
- Reduced need to travel by provision of on site facilities and access to information and services through the internet
- More households changing their travel behaviour and adopting positive lifestyle choices
- A more attractive environment that contributes to regeneration and renewal initiatives
- Increased scope for child friendly housing layouts with fewer roads, vehicle movements and parking areas
- Scope to complement nearby TPs and possibly even assisting them in achieving more ambitious initiatives
- Existing residents in the neighbourhood will enjoy a less polluted environment and improved road safety that will especially benefit children and other vulnerable groups."

Horsham Core Strategy, February 2007

- 2.3.6. The Horsham District Council Core Strategy sets out the key elements of the planning framework for the district including providing the basis for a longer term spatial strategy.
- 2.3.7. Policy CP6 sets out a number of key transport and infrastructure principles of Strategic Development West of Crawley, which have been considered within the TP and the site design/transport principles. These include:
- the new development should be integrated with the physical and social infrastructure of Crawley, and with the landscape;
 - the development should take place on a 'neighbourhood' principle with the provision of a mix of uses which are likely to include shops, employment, a primary school, a library service, doctors surgery, public open space, local transport infrastructure as well as housing, including affordable homes;
 - sufficient transport infrastructure should be provided to meet the needs of the new development whilst maximising the opportunities for sustainable travel, including reducing the dependency on the car by providing access to local facilities and services, providing high quality passenger transport links, such as Fastway to Crawley and ensuring safe, alternative and convenient pedestrian and cycle routes between the development and Crawley and to the countryside;
 - the development should seek to minimise any increase in levels of traffic through the existing neighbourhoods of Crawley and where possible, relieve pressure on the existing road network

Crawley Core Strategy, October 2008 Revision

- 2.3.8. Within the Crawley Borough Council Core Strategy, Policy W1 promotes the creation of a Joint Area Action Plan (JAAP) for the West and North West of Crawley to be prepared jointly by Horsham District Council and Crawley Borough Council.

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West of Bewbush Joint Area Action Plan

- 2.3.9. The development vision for Kilnwood Vale highlighted in the West of Bewbush Vale Joint Area Action Plan is for "A sustainably built and located development, based on the neighbourhood principle..." where "The neighbourhood will be served by excellent public transport opportunities, which will give access to a wide range of services and facilities, Crawley town centre and employment opportunities. There will be high quality open spaces and informal leisure facilities but there will also be links into the surrounding countryside, the character of which will be respected."
- 2.3.10. Maximising the opportunities for sustainable transport is a policy requirement of the Councils' Core Strategies and a key objective and principle to delivering the neighbourhood.
- 2.3.11. The JAAP states that the "neighbourhood should include a network of pedestrian and cycle ways providing direct quality links between the residential areas, open spaces and the neighbourhood centre." This is reinforced through proposals for the creation of a network of green linkages based upon the Conceptual Masterplan.
- 2.3.12. Policy WB 14 – Green Linkages, including a circuit around the neighbourhood and a crossing to provide access to south of the A264.
- 2.3.13. The improvements identified in the TP to provide the neighbourhood with a high quality bus service linking the neighbourhood to the town centre, the town's main employment areas and Gatwick are also set out within the JAAP. The improvements to the existing bus services are set out below:
- Fastway service 10 extended into the site
 - Extension of service 200 into the site
 - Additional service 201 (similar service to 200 but operates via Ifield West rather than Bewbush).
 - Divert service 23/24 through the site.
- Note: Diversion of existing services in to the Site will be subject to the agreement of the existing operating companies - a degree of subsidy may be required to encourage bus operators to extent services into the site during the early years.
- 2.3.14. Due to the presence of a rail line which runs through the site the JAAP acknowledges that it is appropriate that the provision of a new station is pursued due to the sustainable transport advantages that it would bring.
- 2.3.15. Policy WB 24 - Railway Station states that "land required to deliver a railway station and associated uses, including railway station parking within the neighbourhood is safeguarded in accordance with the Conceptual Masterplan pending a definitive decision by Network Rail regarding the provision of a railway station."
- 2.3.16. The JAAP identifies that a TP Strategy should be developed as part of the package of sustainable transport measures. It states that the strategy should "incorporate measures to encourage new residents to minimise the number of car trips made and should be a key component in the overall transport strategy for the development."
- 2.3.17. The primary objective of the strategy is to reduce the need to travel (especially by car), and secondly to achieve high levels of sustainable transport accessibility.

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2.3.18. The following sustainable transport measures are identified in Policy WB 25 – Transport;

- Pedestrian, cycle and equestrian access into:
 - Ifield West
 - Bewbush
 - rural areas to the north and south across the A264 to the AONB
- Three crossings of the railway, with two capable of accommodating vehicular traffic
- Bus and Fastway access at Sullivan Drive, Bewbush (bus gate)
- Bus access at:
 - Woodcroft Road, Ifield West (bus gate)
 - The primary A264 junction
- Measures to secure and maintain suitable bus and Fastway services to the neighbourhood during construction and for the first 3 years after completion of the neighbourhood
- Provision of a primary highway access onto the A264 to be provided in the form of a roundabout, potentially improving the access arrangements into Holmbush Potteries Industrial Estate
- Provision of a secondary left in, left out and right in access onto the A264 for emergency vehicle access only or limited access for necessary or sustainable modes of transport
- Delivery of (or contributions to) junction improvements at the A23/A2220, Junction 11 of the M23, and at the A264/A2220, to mitigate the impacts of Kilnwood Vale (to be fully determined as part of the planning application)
- A TP Strategy

2.3.19. The delivery of an effective TP will assist in ensuring the objectives set out within the JAAP are met, namely reducing the need to travel (especially by car) and achieving high levels of sustainable transport accessibility.

2.4 Summary

2.4.1. The national and local policies and guidance set out above have influenced the development of the masterplan and sustainable travel opportunities proposed for the development. Further information on the development proposals are discussed in further detail within this report.

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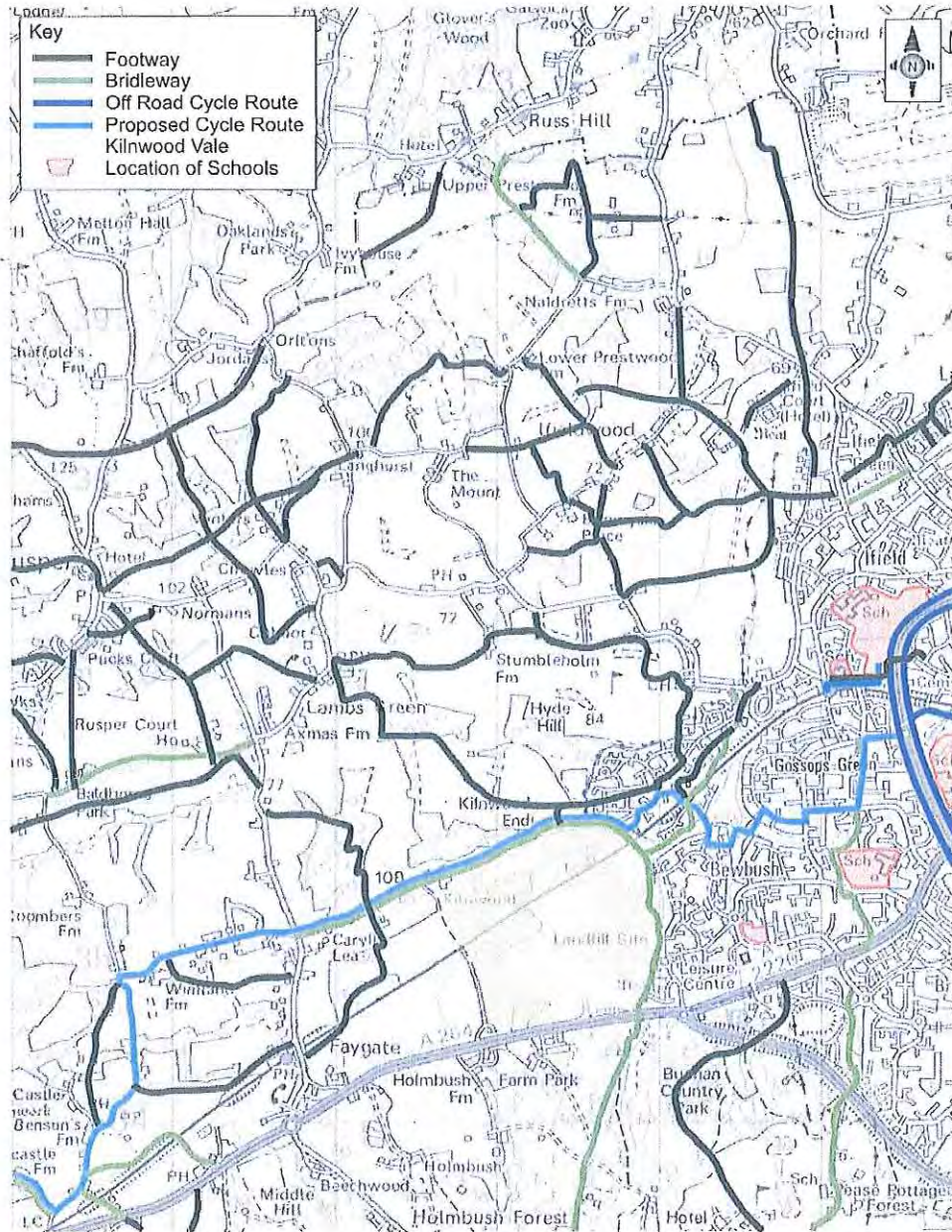


Figure 3 – Local footways/cycleways/bridleways

3.2.3. Table 4 below contains the suggested acceptable walking distances by the Institute of Highways and Transportation for pedestrians without mobility impairment, for some common trip purposes.

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Definition	Town Centres (metres, m), (mins)	Commuting/School Sight-seeing (metres, m), (mins)	Elsewhere (metres, m), (mins)
Desirable	200, 2.5	500, 6.25	400, 5
Acceptable	400, 5	1000, 12.5	800, 10
Preferred Maximum	800, 10	2000, 25	1200, 15

Source: Providing for Journeys on Foot, Institute of Highways and Transport (IHT 2000)
Table 4: Suggested Acceptable Walking Distances

- 3.2.4. It should be noted that people are more likely to walk further to a railway station (800m) than a bus stop (400m).
- 3.2.5. Existing primary schools, secondary schools, local centre/retail, leisure centre, community centre and General Practitioner are all within acceptable walking or cycling distance from the site.
- 3.2.6. Further analysis of accessibility to key services has been undertaken using Accession software as shown below.

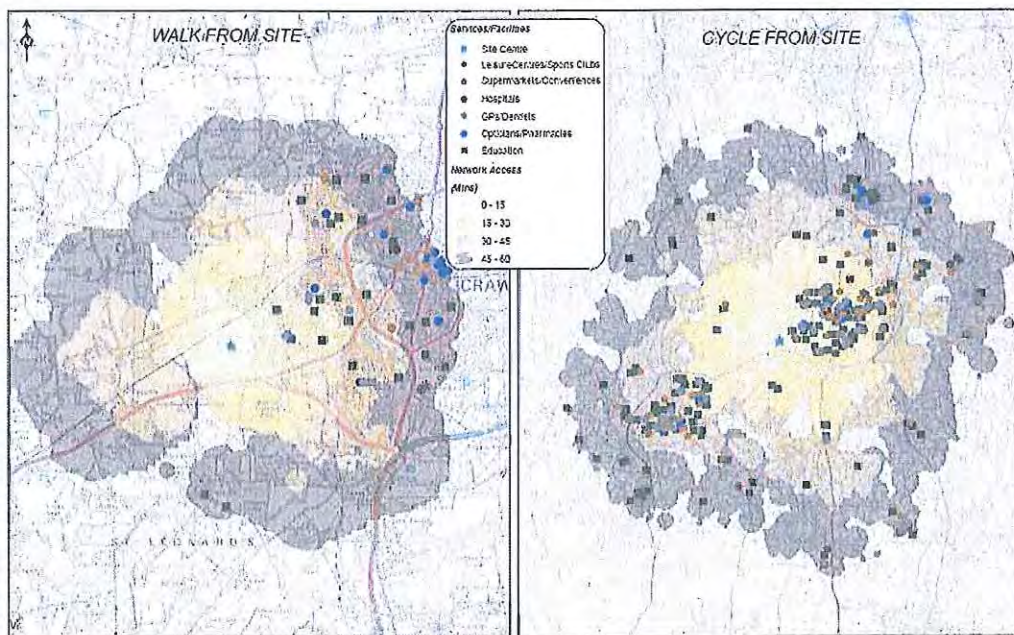


Figure 4 - Accessibility to Key Local Facilities for Pedestrians/Cyclists

- 3.2.7. This shows accessibility is good by both walk and cycle mode, with the majority of Crawley being reached within a 30 minute cycle ride.

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- 3.2.8. The development will deliver local facilities as well as being served by existing facilities at Bewbush, Ifield West and Gossops Green, including schools, local GP, dentists, pharmacies and shops. Leisure facilities, hospitals, and supermarkets are accessible for cyclists.

3.3 Buses

- 3.3.1. The existing local bus routes serving the Bewbush and Ifield West areas, including their routes and frequencies, are detailed below and shown in Figure 5.
- 3.3.2. **Service 1:** Bewbush West – Bewbush – Gossops Green – Crawley – Southgate – Broadfield (operates every 15 minutes Monday to Saturday daytimes and every 30 minutes in the evenings and on Sundays);
- 3.3.3. **Service 2:** Ifield West – Ifield – Crawley Hospital – Crawley – Furnace Green – Tilgate – K2 Leisure Centre (every 12 minutes Monday to Saturday daytimes, every 20 minutes Sundays and 30 minutes evenings);
- 3.3.4. **Fastway Service 10:** Bewbush – Broadfield – Southgate – Crawley – Manor Royal – Gatwick Airport (every 8 minutes Monday to Saturday daytimes, every 20 minutes in the early mornings and evenings, every 15-20 minutes on Sundays and every 30 minutes overnight between 2300 and 0500);
- 3.3.5. **Service 23:** Crawley – Bewbush – Faygate – Horsham – Southwater – Ashington – Washington – Findon – Worthing (Monday to Saturday, every 60 minutes, no service evenings or Sundays);
- 3.3.6. **Service 24:** Crawley – Bewbush – Colgate – Horsham (1 journey in each direction on Mondays to Saturdays);
- 3.3.7. **Gatwick Direct Service 200:** Horsham – North Heath – Faygate – Bewbush – Gossops Green – Langley Green – Manor Royal – Gatwick Airport (every 30 minutes daily between 0430 and 2330); and
- 3.3.8. **Gatwick Direct Service 300:** Ifield West – Ifield – Langley Green – Manor Royal – Gatwick Airport (2-3 peak journeys in each direction, Mondays to Fridays only).
- 3.3.9. Three of the local Metrobus services (routes 1, 10 and 200) currently terminate at Bewbush (Dorsten Square), which is located close to the site.
- 3.3.10. Service 10 is also known as 'Fastway'. It is a high-quality bus service operating 24 hours a day between Bewbush, Crawley town centre and Gatwick Airport using a mix of on-street running, dedicated bus lanes, bus-only through routes and guideways. It is the result of a partnership between the local authorities, Metrobus and BAA Gatwick which saw passenger numbers boosted significantly in the Crawley area. The service is operated with high-specification new vehicles.
- 3.3.11. Service 2 provides a link into the Ifield West area from Tilgate, Furnace Green and Crawley town centre every 12 minutes during Monday to Saturday daytimes.
- 3.3.12. Service 1 operates between Bewbush, the town centre and to Broadfield. This is a 15 minute frequency service which operates along a relatively less direct route to the town centre and out to Broadfield, serving a number of residential areas away from the main road network.

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- 3.3.13. Service 23 provides an hourly service between Crawley, Horsham and Worthing, with one additional journey on service 24 serving Colgate as an alternative to Faygate.
- 3.3.14. Services 200 and 300 are branded as 'Gatwick Direct'. Service 200 provides the fastest public transport journey between Bewbush and Gatwick Airport with an approximate journey time of 25 minutes. This service bypasses Crawley town centre to the north and west, providing a direct link with Langley Green and the Manor Royal industrial area. It also passes close to Ifield railway station. In conjunction with service 23, the route now provides three buses per hour to Horsham.

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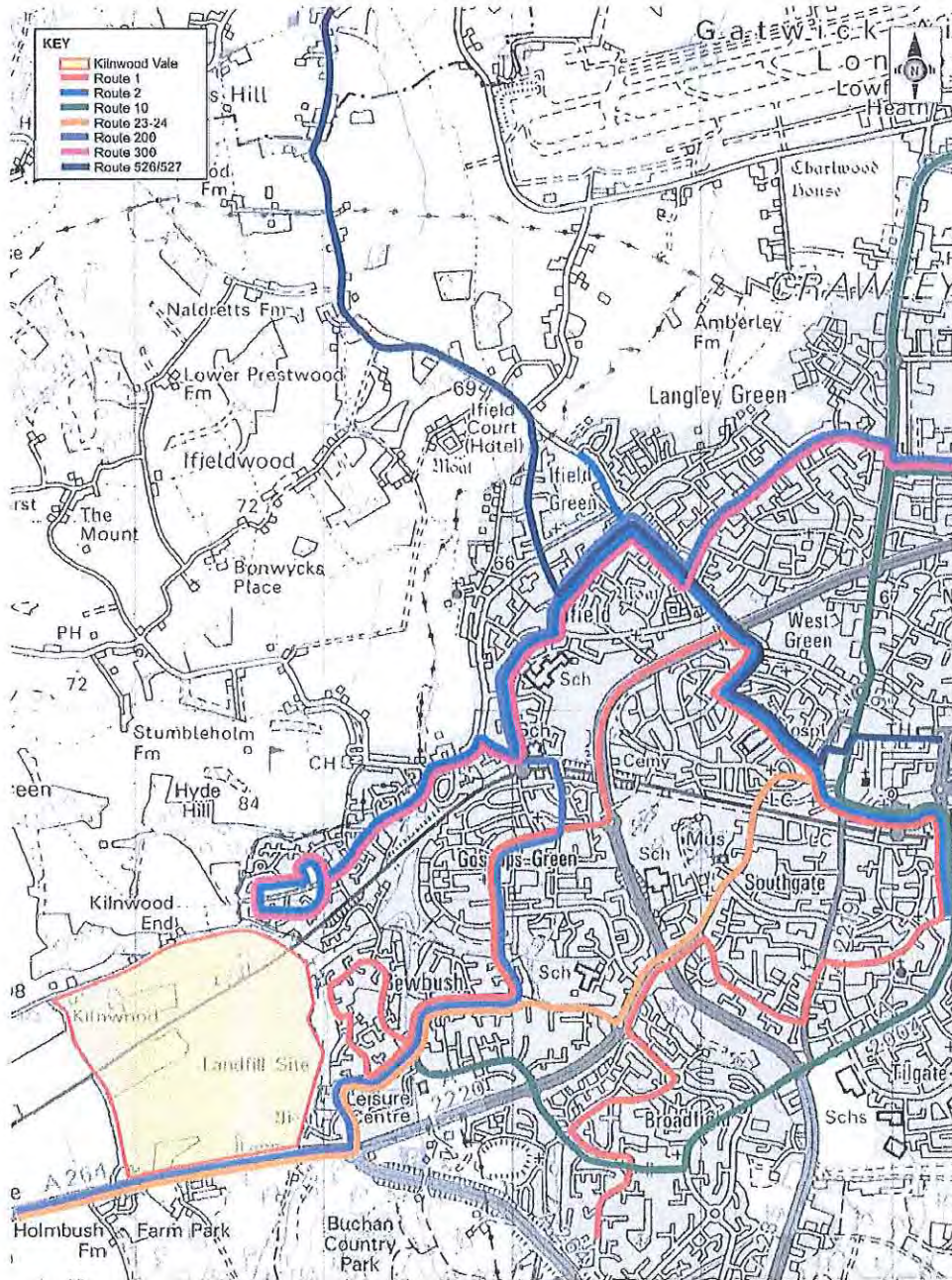


Figure 5 – Local Bus Services

3.3.15. The accessibility to key services by local bus services is shown below.

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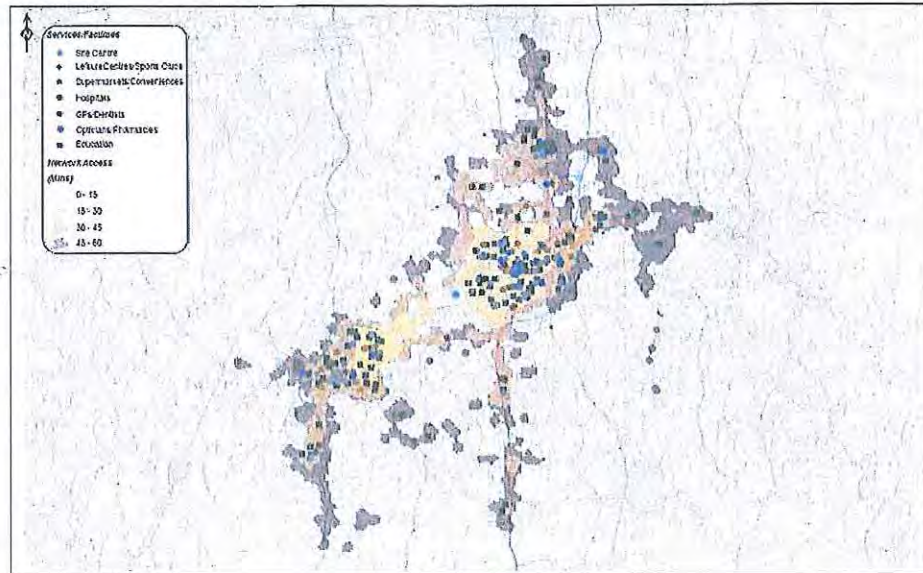


Figure 6 – Accessibility to Key Services by Bus

3.3.16. This shows that a large proportion of key services are accessible and within 30 minutes of the site, based on the existing bus facilities.

3.4 Rail

3.4.1. Ifield railway station is located approximately 2685m to the north east of the site and Faygate railway station approximately 2560m to the south west of the site.

3.4.2. There are five services during both the AM and PM peak at Ifield station between Horsham and London Bridge/London Victoria (two-way). For trains to London Victoria a change is required at Gatwick Airport or East Croydon Station.

3.4.3. Two services also stop at Faygate Station in each direction, these however only stop at peak times on Mondays to Fridays. There is also an additional train in each direction at lunchtime Monday to Friday.

3.4.4. Both Faygate and Ifield railway stations have the following constraints:

- 1 Limited operational capacity (currently 4 car configuration operates), the station could not accommodate longer trains such as those planned for the Thameslink service (12 cars);
- 2 Use of substandard facilities (platform widths);
- 3 Enhancements costly and disruptive, (possible TWA order required to acquire land, if supported by Network Rail);
- 4 Increased rail heading at Ifield resulting in unsustainable pressure on road parking;
- 5 Increased "rat running" through residential areas;

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- 6 Substandard access and egress;
 - 7 Single point ticketing;
 - 8 Increased inconvenience due to short trains, lack of parking and access;
 - 9 Greater increase in road traffic from new development;
 - 10 Increase in road congestion from rail heading;
 - 11 Poor bus access;
 - 12 Inadequate car parking and pick up/drop off facilities.
- 3.4.5. Despite a number of issues that have been observed at both nearby stations, it is recognised that these stations provide good access to the rail network for the development.

3.5 Highway Network

- 3.5.1. The site lies adjacent and to the north of the A264 and can be reached via the M23 at junction 11. The A264 is a primary distributor road between Horsham and Crawley.
- 3.5.2. Kilnwood Lane, which is an unclassified access road, runs east to west along the northern boundary of the site.
- 3.5.3. Faygate Lane runs north to south to the west of the site and links the A264 with Kilnwood Lane. This provides a vehicle crossing over the railway line.
- 3.5.4. The residential area of Bewbush lies to the east of the site. The current access to the landfill site is central to the site frontage from the A264. Further to the west there is an access to a private track which runs north to south.
- 3.5.5. The Transport Assessment outlines in detail the existing situation and performance of the highway network. Queue length observations were made along the A264 and A23 in May 2006, which observed queues in a number of locations, including Crawley Ave A23/Gossops Drive junction, Crawley Ave A23/Horsham Road A2220 junction, Bewbush Drive/Horsham Road A2220/Broadfield Drive junction, M23 Junction 11
- 3.5.6. Registration plate surveys were also undertaken in close vicinity of the site which established that there was a degree of rat-running occurring through the residential areas of Bewbush, Ifield, and Langley Green, to avoid congestion on the A2220 and A23.

3.6 Summary

- 3.6.1. It is considered that the existing site already offers good opportunities to travel by sustainable modes. There are numerous footways, cycleways and bridleways in close proximity to the site, as well as a number of bus services (1, 10, 23/24, 200 and 300) that currently terminate or stop at Dorsten Square in Bewbush. In addition, the development is also located approximately 2.5km from Ifield Rail Station.
- 3.6.2. The masterplanning of the site and its pedestrian, cycle, bus and vehicular access points have been designed to take full advantage of its sustainable location.

4 Proposals for Improving Accessibility to the Development

4.1 Introduction

4.1.1. This section sets out the sustainable transport proposals for the development, including walk, cycle, bus, rail, and highway. These proposals are also explained in detail within the Transport Assessment.

4.2 Walk, Cycle and Equestrians Improvements

4.2.1. Figure 7 below shows the walk, cycle, and equestrian improvements proposed as part of the development.

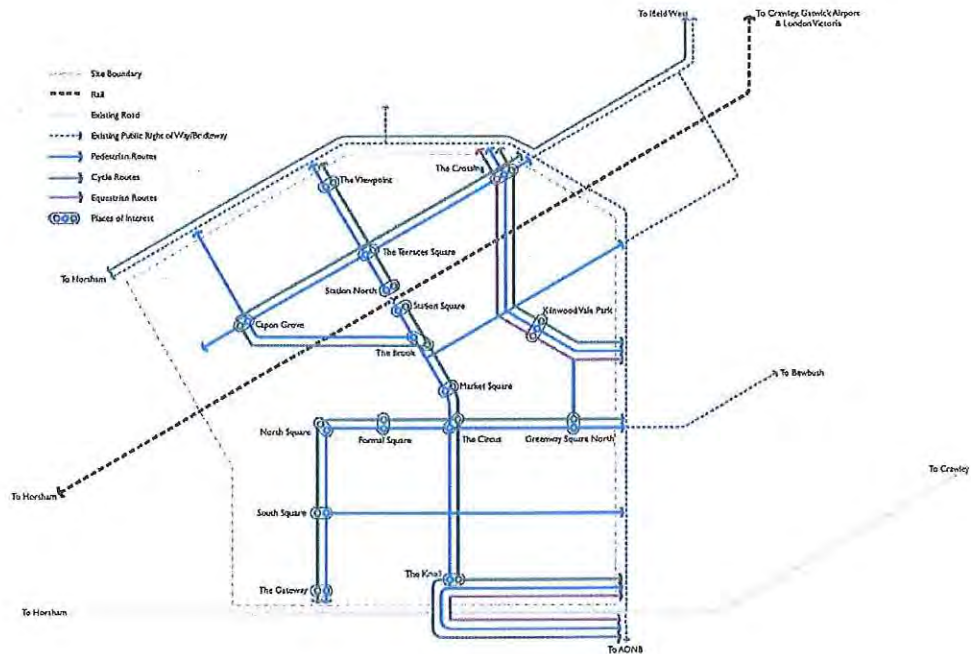


Figure 7 – Pedestrian/Cycle/Equestrian Proposals

4.2.2. It is evident that the masterplan has been developed to enable ease of movement by pedestrians and cyclists through the provision of numerous links within the site between key destinations within the site, such as the Market Square and the potential railway station. There are also routes proposed to link with the existing public rights of way/bridleway which runs along the northern and eastern edges of the site boundary and to link Bewbush and Ifield West to the east and northeast of the site, where there are local facilities.

4.2.3. In addition to the links shown above, leisure routes or green segregated routes connect the recreational spaces. Shared surfaces are provided at low trafficked residential roads to accommodate other modes.

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4.2.4. The site also delivers an equestrian route through the development in the north east corner, ultimately providing an alternative elevated route across the railway line avoiding the existing at grade crossing facility.

4.3 Bus Improvements

4.3.1. Figure 8 below shows the bus improvements proposed as part of the development. This includes extensions to the Fastway 10 service into the site, diversions of services 23, 24 and 200, and the extension of service 300 into the site.

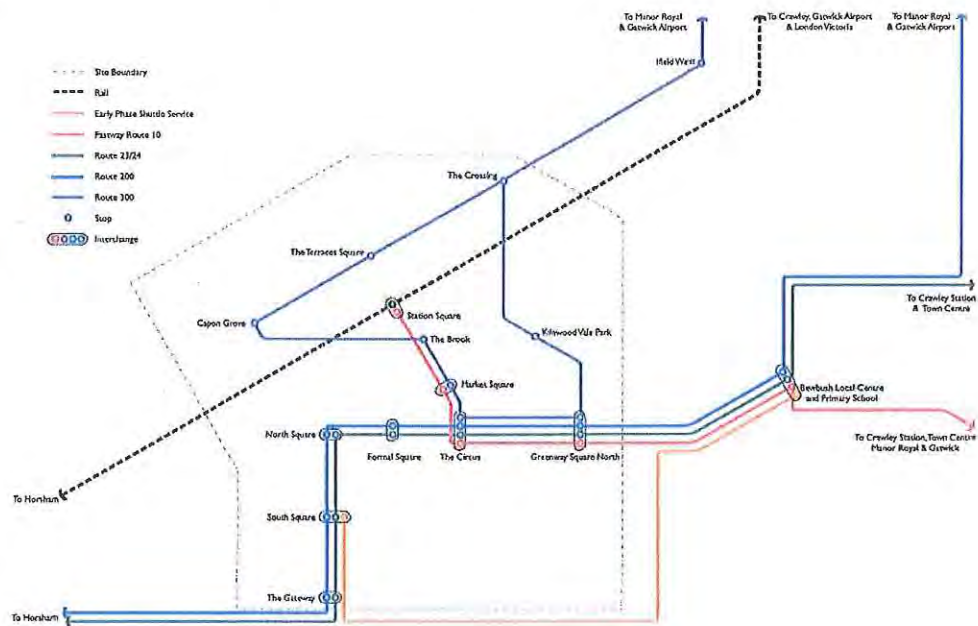


Figure 8 – Bus Improvements

- 4.3.2. Liaison and discussions with Metrobus have been held to agree the principles of these potential service enhancements and extensions¹.
- 4.3.3. Fastway service 10 is proposed to be extended into the site from its existing terminus at Dorsten Square via a new bus gate at Sullivan Drive.
- 4.3.4. Currently, the Fastway service operates an 8 minute service (10 minutes in peak hours) frequency on the Monday to Saturday daytime service. It is proposed that this frequency will be at least retained (and possibly enhanced) following the extension of the service into the site. This will require additional vehicles in order to retain the current level of service.

¹ Diversion of existing services in to the Site will be subject to the agreement of the existing operating companies - a degree of subsidy (max 5 years as per JAAP) may be required to encourage bus operators to extend services into the site during the early years.

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- 4.3.5. Services 23/24 are proposed to operate through the south of the new development using a proposed bus gate at Sullivan Drive and the main site access junction on the A264. This would provide an hourly Monday to Saturday daytime service to Horsham and Worthing. Services operate at peak times would provide journey opportunities for residents wishing to travel to work in either Horsham or Worthing.
- 4.3.6. The proposed extension of the 'Gatwick Direct' service 200 to the development site via Bewbush would provide a direct and fast link between a development and the major employment areas at Manor Royal and Gatwick Airport.
- 4.3.7. In addition, it is proposed that the recently introduced service 300 will also be extended into the site, with a potential enhanced frequency. This operates along the same route as the 200 service until Rusper Road, then it operates via Ifield West. It will enter the site through a new bus gate at Woodcroft Road.
- 4.3.8. Internal bus routes have been discussed with Metrobus and have been identified to maximise accessibility of the services for residents whilst balancing the need to deliver direct, reliable services, particularly for Fastway service 10.
- 4.3.9. It is anticipated that the new Sullivan Drive bus gate is delivered early in Phase 3, and the new Woodcroft Road bus gate in Phase 4². It is also proposed that a shuttle bus³ will be provided will operate between the development and Dorsten Square via the A264 until public transport services are extended into the site. This shuttle service will provide frequent link to the range of services at Dorsten Square, including the Fastway 10 service and will encourage travel by sustainable modes from early occupation of the development.

4.4 Rail Improvements

- 4.4.1. There is the opportunity to introduce a new railway station, as the railway line runs through the northern section of the site. Preliminary design and evaluation has been undertaken to demonstrate that the site could facilitate a new railway station with the opportunity of associated car parking and a multi-modal interchange.
- 4.4.2. The previous section identified some of the issues at the existing local stations (Faygate and Ifield), which a new station could help deliver improvements in relation to these issues.
- 4.4.3. A railway station in this location would support long term growth and would:
- Provide platform lengths for 12 car operation (currently not achievable at Ifield and Faygate stations);
 - Provide a modern fully compliant facility;
 - Encourage rail usage (ease of access, safe, protected, user friendly);
 - Be fully Mobility Impaired Persons (MIP's) compliant;
 - Be easily accessible;

² if by the trigger point for the bus gate any necessary rights agreements traffic orders and authorities are still to be granted, the developer will deposit a sum equal to the construction costs of the Bus gate plus a 10% contingency as security for the completion of the linkage.

³ It is anticipated that the shuttle bus should be well subscribed from the outset and as population builds up it should not take long for this service to be fully subscribed. Once the first shuttle bus becomes self-funding then further additions to the service can be made.

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- Be serviced without detrimental affect on existing service pattern;
- Capable of accommodating predicted passenger capacity;
- Form the focal point of a multi-modal transport interchange;
- Provide the opportunity for increased rail patronage locally;
- Provide relief from rail heading at Crawley, Three Bridges and other commuter route stations
- Reduce road traffic resulting in a reduction in congestion;
- Improve road safety resulting from a reduction of car usage;
- Provide a safer rail crossing (footbridge) with closure of the existing unmanned at grade crossing;
- Be capable of being constructed with minimal disruption to current service patterns; and
- Be consistent with the aspirations and requirement of the proposed Thameslink Project (formerly Thameslink 2000).

4.4.4. Discussions with Network Rail (NR) indicate their support in principle subject to further detailed evaluation.

4.5 Highway Improvements

4.5.1. As is discussed in the Transport Assessment Report, the transport proposals for the Kilnwood Vale development include the provision of a main vehicle access directly onto the A264 and a secondary signalised access. Contributions to off-site highway improvements are also proposed to mitigate the peak hour impacts of the development, which have been determined in the Transport Assessment.

4.5.2. The approach has been taken to identify junction improvements which mitigate the 'residual' impact of the development, i.e. assessing the vehicular impact once the sustainable transport proposals have been determined and assessed. Monitoring will also be undertaken to trigger contributions to the identified improvements.

4.5.3. Delivery of the following highway improvements will be made:

- Main roundabout access on the A264
- Secondary left in, left out and right out signalised access onto the A264 for construction traffic in the short terms and other modes in the long term. An equestrian crossing facility will be integrated with the design.

4.5.4. Contribution to the following highway improvements will be made:

- Slip road⁴ and, at a later date, the signalisation of the A23/A2220

⁴ Unless works are carried out in lieu of contribution - contribution considered preferable as it gives flexibility over the precise nature of the works needed (if any) or the opportunity to delay or adjust the works if they can be combined with other improvements

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- Potential signalisation of Junction 11 of the M23
- Potential signalisation of A264/A2220 junction

4.6 Summary

- 4.6.1. The transport package is considered to deliver excellent opportunities to travel to/from the site by sustainable means and improves accessibility to facilities for existing neighbouring residents and employees. The transport package includes significant measures, including
- extensions and enhanced frequencies to a range of bus services into the site;
 - the provision of two bus gates direct into the adjacent neighbourhoods;
 - bus lane/advance at the main access;
 - good walk/cycle connections both within and out of the site;
 - alternative 'at grade' crossing over the A264 and railway line for the bridleway; and
 - the potential delivery of a railway station.

5 Base Data and Prediction

5.1 Introduction

- 5.1.1. WSCC Travel Plan policy requires that the TP includes details of the assumptions and methodology agreed within the Transport Assessment Report supporting the planning application. A summary of the trip generation, distribution, mode share and assignment assumptions are discussed within this section.
- 5.1.2. These assumptions and methodologies have been agreed with both WSCC and the Highways Agency (HA) during the preparation of the Joint Areas Action Plan and with any updates agreed through the issue of the Scoping Report at the pre-application stage.

5.2 Trip Generation

- 5.2.1. The following table summarises the residential, employment, and local food store person trip rates that have been agreed with WSCC. Further information on how these trip rates were determined has been included within the Transport Assessment.

Person Trip Rates	AM Peak (0800-0900)		PM Peak (1700-1800)	
	Arr.	Dep.	Arr.	Dep.
Residential Person Trip Rate (per dwelling)	0.359	0.757	0.493	0.232
Employment Person Trip Rate (per 100m ² Gross Floor Area)	1.88	0.39	0.18	1.34
Local Food Store Person Trip Generation (per 100m ² Retail Floor Area)	8.12	4.811	19.447	20.857

Table 5: Agreed Adjusted Trip Rates

- 5.2.2. Table 6 summarises the total person trips for each land use during the peak periods.

Person Trip Rates	AM Peak (0800-0900)		PM Peak (1700-1800)	
	Arr.	Dep.	Arr.	Dep.
Residential Person Trips	951	2006	1306	615
Employment Person Trips	150	31	14	107
Foodstore Person Trips	203	120	486	521

Table 6: Development Trips Generated (per land-use)

- 5.2.3. During the preparation of the Transport Assessment, discussions with possible food retail operators has highlighted that there may be the potential to deliver a small, four pump petrol filling station. In order to ensure a robust assessment, the vehicular impact of this has also been considered.
- 5.2.4. Analysis of the TRICS database has established that a petrol filling station could generate approximately 20 two-way vehicle trips per pump in both the AM and PM peak periods, with the same proportion arriving and departing in both peak periods (i.e. 10 arriving and 10 departing per pump).
- 5.2.5. The possible rail station is likely to include car parking provision for up to 200 spaces. This will potentially attract vehicular traffic from off-site.
- 5.2.6. It is proposed that the station car park will reach full capacity (200 spaces) by 10am on a typical weekday, and that all vehicles using any car park will originate from off-site. LATS

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2001 data has been interrogated in order to analyse the boarding profile at existing stations on the Horsham to Crawley and Brighton to Victoria lines. Based on daily boarding data for a number of local stations, it has been established that approximately 30% of boardings between 0600-1000 occur between 0800-0900, therefore this proportion of the 200 vehicles which might park are assumed to arrive at the station car park during the peak hour. This equates to 60 vehicles arriving between 0800-0900, assuming all 200 vehicles using the car park arrive between 0600-1000. This level of traffic is also assumed to depart from the station car park in the PM peak period (1700-1800).

5.3 Trip Distribution Methodology

- 5.3.1. The agreed trip distribution was determined is set out within the Transport Assessment.
- 5.3.2. The **residential trip distribution** has been based upon:
- trip purpose proportions identified within National Travel Statistics
 - Census Data distributions for usual place of work and employers business
 - Roadside Interview Surveys as a basis for other trip purposes
- 5.3.3. Roadside interview surveys carried out in May 2006 on the A264 provide an indication of likely distribution of trips for each trip purpose, as defined below:
- 1 = Home/Holiday Home
 - 2 = Usual place of Work
 - 3 = Employers Business
 - 4 = Education
 - 5 = Shopping
 - 6 = Personal Business
 - 7 = Visit Friends
 - 8 = Recreation/Leisure
 - 9 = Other
- 5.3.4. These distributions have been reviewed and adjusted where necessary, with agreement from WSCC and the HA. The education and leisure distributions have been updated to reflect the location of the local schools and leisure facilities, as relatively few education and leisure trips were surveyed.
- 5.3.5. It has been assumed that 40% of education trips (including escorting) would be undertaken within the development site to the new primary school within the site. 40% of trips would be made to the closest secondary school and the remaining to other local schools. 'Usual place of work' trips have been distributed in line with 'journey to work' (JTW) 2001 census data from the Bewbush ward. It has been assumed that an additional 5% of 'usual place of work' trips would be travelling to the planned employment in the Manor Royal area.
- 5.3.6. Analysis of the 2001 census data shows that 13% of JTW trips are made within the Bewbush ward. This is similar at the Gossops Green ward. Approximately half of these are work at home trips. Therefore 6% of residential trips are assumed to have destinations within the development area.
- 5.3.7. The **employment trip distribution** has been based upon 2001 JTW Census Data. Bewbush JTW distributions were selected with agreement from WSCC and HA to best reflect the likely distributions of any local employer.

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- 5.3.8. The agreed distribution proportions were on the Bewbush ward, but the proportion of trips arriving from the Bewbush ward was reduced from 69.5% to 8% (similar to neighbouring wards). It is also assumed that 10% of trips would arrive from within the development (lower than the 13.1% arriving from the same ward as the Holmbush Potteries Industrial Estate). These agreed distributions are shown in Table 7.

Residence	Total	% of Total	Proposed distribution
Hanover and Elm Grove Ward	3	0.70%	1.84%
North Portslade Ward	3	0.70%	1.84%
St. Anthony's Ward	3	0.70%	1.84%
Chailey and Wivelsfield Ward	3	0.70%	1.84%
Brookfield Ward	3	0.70%	1.84%
Bury Ward	3	0.70%	1.84%
Bewbush Ward	317	69.50%	8.00% (estimate)
Broadfield North Ward	13	2.90%	7.62%
Broadfield South Ward	12	2.60%	6.83%
Furnace Green Ward	13	2.90%	7.62%
Gossops Green Ward	12	2.60%	6.83%
Ifield Ward	7	1.50%	3.94%
Langley Green Ward	3	0.70%	1.84%
Northgate Ward	6	1.30%	3.42%
Pound Hill North Ward	3	0.70%	1.84%
Southgate Ward	6	1.30%	3.42%
Tilgate Ward	3	0.70%	1.84%
West Green Ward	3	0.70%	1.84%
Broadbridge Heath Ward	3	0.70%	1.84%
Chanctonbury Ward	3	0.70%	1.84%
Forest Ward	3	0.70%	1.84%
Horsham Park Ward	3	0.70%	1.84%
Itchingfield, Slinfold and Warnham Ward	6	1.30%	3.42%
Roffey South Ward	7	1.50%	3.94%
Rusper and Colgate Ward	3	0.70%	1.84%
Southwater Ward	3	0.70%	1.84%
Copthorne and Worth Ward	3	0.70%	1.84%
Crawley Down and Turners Hill Ward	3	0.70%	1.84%
Haywards Heath	3	0.70%	1.84%
Ashenground Ward	3	0.70%	1.84%
Development			10.00% (estimate)
Total	456	100.00%	100%

Table 7: Agreed Local Employment Distribution

- 5.3.9. For the **local foodstore trip distribution**, it is assumed that this would attract trips from within the development itself, therefore reducing the level of trips made off site. However it is also appreciated that the foodstore could generate a number of 'pass by' trips, and attract trips originating from off site.

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- 5.3.10. The following trip types have therefore been assumed for the weekday peak periods. Further information on how these trip type proportions have been determined are included within the Transport Assessment.

Trip Type	Proportion
'Pass By' Non Development Trips	37%
'Linked' Development Trips	15%
'Primary' Development Trips	13%
'Primary' Non Development Trips	35%

Table 8: Foodstore Trip Types

- 5.3.11. It is assumed that:

- the 'pass by' non development trips will be already using the A264;
- the 'linked' development trips will carry out the retail aspect of their journey at the beginning or end of their trip, and will therefore not see any change to the trip distribution outside of the site.
- The 'primary' development trips will undertake their retail trip within the development
- The 'primary' non development trips will be from local areas, including Bewbush, Gossops Green, lfield, and Holmbush Forest.

- 5.3.12. For the **Petrol Filling Station Trip Distribution**, it is assumed that 50% of trips will be 'linked' or 'primary' development trips; 30% of trips will be 'pass by' non development trips; and 20% of trips will be 'primary' non development trips.

- 5.3.13. The same assumptions are applicable here for the 'linked' and 'primary' development trips, and the 'pass by' non development trips, as in the local food store assumptions.

- 5.3.14. For the 'primary' non development trips, it has been assumed that they will only be generated from local areas, such as Bewbush and Gossops Green.

- 5.3.15. For the **Rail Station Car Park Trip Distribution** it is considered that the station would only attract existing car users, and only those that are currently using the A264, as it is considered that car drivers are unlikely to reroute to any station at Kilnwood Vale from the wider area. The distribution of vehicles using the car park from the east and west on the A264 has been based on the flow proportions estimated for the baseline 2022 future forecast.

5.4 Mode Share Methodology

- 5.4.1. As is discussed within the Transport Assessment, the WSCC multi-modal transport model has been used to determine the predicted split of modes between car, bus and rail. The number of people walking and cycling has been broadly based on the 2001 JTW Census data. However, amendments to the walk and cycle mode share have been proposed and agreed with WSCC (as discussed in the Transport Assessment Scoping Report).

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- 5.4.2. A summary of the changes made to the mode shares are set out in the table below. Further information on workings and calculations are set out in the Transport Assessment.

		Walk	Cycle
Bewbush	AM	53.87%	2.15%
	PM	53.75%	2.15%
Gossops Green	AM	49.56%	2.80%
	PM	27.87%	2.80%

Table 9: Agreed New Walk and Cycle Mode Share To Bewbush and Gossops Green

- 5.4.3. In addition, the development car occupancy rate will be based upon the levels taken from National Travel Statistics.
- 5.4.4. Further assessment has also been undertaken in order to examine the effects of travel planning. A study of the potential effects of 'soft' travel planning measures on car usage, based on the DfT's 'Smarter Choices' Report (2005), which states that a reduction in peak period urban traffic of 21% could be achieved, is included in the Transport Assessment Appendices. This study applies this research to Kilnwood Vale and highlights that the overall reductions in car use, based on the travel planning measures proposed for the development, would be in the region of 15% from base trip levels (without travel planning). This has been agreed with WSCC.
- 5.4.5. This also complies with the WSCC Development Travel Plan Policy, which outlines a target "to reduce the number of vehicle trips generated over a 12 hour period (weekday 7am – 7pm) by the site by a minimum of 15% in urban areas and 10% in rural areas."

5.5 WSCC Multi Modal Model

- 5.5.1. The WSCC multi-modal model has been used to undertake this assessment which uses the SATURN/TRIPS suites of computer software.
- 5.5.2. The model has been updated and validated based on this data and approved by WSCC.
- 5.5.3. The base year of the WSCC model is 2005. The forecast model is 2022. It has been previously agreed with WSCC that the 2022 model would be sufficient to assess the proposed development, but it should be noted that recent work identifies that the likely completion date will now be 2023.
- 5.5.4. The following committed developments planned to be completed by 2022 have also been included:
- Phase 3 of the Fastway network
 - The New Leisure Centre (K2)
 - The town centre North Mixed Use Development
 - Telford Place Mixed Use Development
 - The New University
 - Thales Business Development
 - BOC Edwards Business Development
 - Crawley Business Quarter Development; and
 - Fairview Homes Development
 - North East Sector Development

6 Aims and Objectives

6.1 Travel Plan Objectives

6.1.1. It is essential that before considering potential measures for a TP there is an agreed set of objectives which can be adopted and thereby influence all actions arising from the plan. The following suggested objectives are informed by best practice guidance but also reflect local circumstances and stakeholder requirements;

- To reduce single occupancy car use to and from the development
- To encourage sustainable communities and neighbourhoods
- To promote healthy living and activity
- To complement strong sustainable urban design elements
- To support national and local planning and transport policies

6.1.2. These objectives have been broadly based on the DfT's DaSTS goals that relate specifically to Travel Planning (as discussed in Section 3). Consideration for meeting a number of the other DaSTS goals, such as 'supporting economic competitiveness by delivering reliable and efficient transport networks' has been undertaken in the Transport Assessment.

6.1.3. In addition, as discussed in Section 3, the WSCC Development Travel Plan Policy outlines a number of potential benefits of delivering TPs. These have been reviewed in order to determine further general objectives for the development, and have been used to inform this document. These are:

- Improve accessibility, public transport provision and travel choice for reaching local facilities by residents and the local community
- Enhance social inclusion for those experiencing accessibility difficulties
- Create a sense of community
- Reduce the inequalities that may exist between car/non car owners
- Improve understanding of the benefits of not using the car when alternatives exist
- Reduce the need to travel by providing on site facilities and access to information and services through the internet
- Enable households to change their travel behaviour and adopt positive lifestyle choices
- Increase scope for child friendly housing layouts with fewer roads, vehicle movements and parking areas

6.1.4. Furthermore, in order to ensure compliance with the WSCC Development Travel Plan Policy, the 'TRACES Evaluation Methodology' has also been reviewed and taken into account upon creating this TP.

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- 6.1.5. The 'TRACES Evaluation Methodology' must be 'Transparent', 'Realistic', 'Achievable', 'Committed', 'Enforceable', and 'Sustainable'.
- 6.1.6. One key objective of the TP is the commitment to delivering a number of sustainable measures from the beginning of the development, including both hard and soft measures. As discussed in DfT's (2009) 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process', "it is important to establish sustainable travel behaviour from the beginning, whatever the nature of the development, because changing established patterns of travel is more difficult."
- 6.1.7. It is considered that this approach will have the most significant effect on minimising car use to/from the development, rather than 'retro-fitting' measures into the development at a later stage.
- 6.1.8. The approach for this TP is to encourage 'rational' transport choices by residents in terms of their location and destination, as well as maximising sustainable transport choices. The guiding principles are to combine 'hard' (new infrastructure) and 'soft' (e.g. promotional material) measures in a package underpinned by the accessible location of the Kilnwood Vale development.
- 6.1.9. It should be recognised by the Highway Authority that it is easier at the outset to predict travel patterns for a school, commercial, retail or industrial development than for a mixed use (but predominantly) residential site. Also with the other forms of development, the end user is likely to be a single entity such as the development promoter or a tenant (who will be contractually obligated to conform to any targets set), and who will have a greater degree of control of a development to enable a TP to be managed. If failings should arise, a 'single entity' may be readily penalised. By contrast with a mixed use residential development, the developer has little or no control over the freewill of residents. Penalties cannot therefore, be levied on residents if targets are not met, only on the developer. The nature of such penalties is discussed further in Section 10 of this document.

6.2 Targets

- 6.2.1. The targets of the TP have all been determined and assessed using the SMART evaluation criteria, i.e. 'Specific', 'Measurable', 'Achievable', 'Realistic', and 'Time bound'.
- 6.2.2. The TP seeks to achieve WSCC Development Travel Plan Policy "to reduce the number of vehicle trips generated over a 12 hour period (weekday 7am-7pm) by the site by a minimum of 15% in urban areas and 10% in rural areas."
- 6.2.3. The Transport Assessment assumes a 15% reduction in single occupancy car trips compared to standard trip generation for a residential development. The following peak hour mode shares have been predicted for trips to/from the site:

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	AM Peak	PM Peak
Walk and Cycle	21%	16%
Bus	16%	18%
Rail	3%	1%
Car Driver	46%	46%
Car Passenger	14%	19%

Table 10: Development Peak Hour Mode Share

- 6.2.4. In terms of a readily measurable target, which achieves the Councils objective of reducing single occupancy car use, the following targets are proposed:

	Phase 3	Phase 4	Completed Development
AM Peak (0800-0900)	828	997	1228
PM Peak (1700-1800)	926	1046	1204
12 Hour (0700-1900)	7866	9162	10906

Table 11: Target Development Vehicle Trips

- 6.2.5. These targets do not include the delivery of the railway station and associated car parking. The TPC may need to revise the targets with consultation with WSCC, if commitments outside the control of the Developer differ from the assumption made at the application stage, such as: the school catchment covers a significant area outside the neighbourhood, school buses are not provided, retail is significantly more successful than anticipated, more than 2,650 dwellings are built, etc.

7 Measures

7.1 Introduction

- 7.1.1. The design principles, transport proposals and mitigation measures for the development have been influenced from an early stage by the general objectives and aims of the TP. Residents, employees and visitors to Kilnwood Vale will benefit from both 'hard' and 'soft' sustainable measures delivered early in the creation of a new neighbourhood, when new residents are most easily influenced and most likely to change their travel behaviour.
- 7.1.2. In addition to the on-site provision of social community facilities, leisure, employment uses and the potential for a new railway station, the following TP measures will further reduce the need to travel.

7.2 Proposed Measures

- 7.2.1. The table below sets out the measures proposed for the development. These have been split into different categories, based on the WSCC template included in Section 2.4 of the WSCC Development Travel Plan Policy.

REDUCING THE NEED TO TRAVEL		
Measure	Implementation	Responsibility
Appointment of a TPC	No Occupations can occur until a Travel Plan Coordinator is appointed by Crest and his or her contact details are provided to the County Council	Developer
Employment of TPC	The Travel Plan Coordinator appointed by Crest must remain in post for the 10 year Travel Plan Period. This may be an appointment from within Crest's staff or a transport consultant appointed by them. The appointment will be part time but the Nominated Travel Plan Co-ordinator should be "on call" when needed.	Developer
Establishment of a TP Forum	To be set up following appointment of TPC. Six monthly meetings or as otherwise agreed by forum.	TPC

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INCREASING THE USE OF SUSTAINABLE MODES		
Measure	Implementation	Responsibility
'Pedestrian/Cycle only' route provided on main 'spine' of the development	Integrated in design	Developer
Creation of pedestrian and cycle links within the site designed to connect existing facilities adjacent to the site.	Integrated in design	Developer
Pedestrian and cycle friendly infrastructure (based on the 'home zones' approach)	Integrated in design	Developer
Provision of areas within the development for social exchange, recreation, seating, and play	Integrated in design	Developer
Provision of cycle parking spaces	Integrated in design	Developer
Cycle Shower and Changing facilities provided in on-site workplaces	Integrated in design	Developer
Discounted Cycle Training for residents through the Council's Bikeability scheme	By first occupation	Developer/ TPC
Provision of Real Time Information (RTI) equipment	Integrated in design	Developer
Provision of bus routes that allow acceptable accessibility and walking distances to all parts of the development	Integrated in design	Developer
Bus infrastructure such as stands, stops, shelters, and real time information	Integrated in design	Developer
Provision of two bus gates into the development from Sullivan Drive (Bewbush) and Woodcroft Road (Ifield West) in the east and north-east edges of the site boundary	Integrated in design	Developer
Provision of a shuttle-bus for the early phases of the development (phases 1 and 2) to run between the development and Dorsten Square (where Fastway service 10 currently terminates).	A limited stop service shuttle bus service between Dorsten Square and the Site via the A264 which shall be maintained by the Owner for a period of 5 years from the 100 th dwelling occupation or until a local bus service shall have been diverted into the Site (if earlier)	Developer
Extension of existing Fastway Service or similar service into the Site*	This existing bus service will be re-routed into the Site from 900 th dwelling occupations (100 th dwelling of phase 3). It will provide access to the Neighbourhood Centre from the Sullivan Drive bus gate and the A264. This route is subject to the delivery of the bus gate to Sullivan Drive and agreement with the operator.	Developer/bus operator
Diversion of existing services 23/24 through the Site*	This existing bus service will be re-routed into the Site from 900 th dwelling occupations (100 th dwelling of phase 3). It will provide access to the Neighbourhood Centre from the Sullivan Drive bus gate and the A264. This route is subject to the delivery of the bus gate to Sullivan Drive and agreement with the operator.	Developer/bus operator
Diversion of existing service 200	This existing bus service will be re-routed into the Site from 1650 th Dwelling occupations (100 th dwelling of phase 4). It will provide access to the Neighbourhood Centre between Sullivan Drive bus gate and the A264. This route is subject to the delivery of the bus gate to Sullivan Drive and	Developer/bus operator

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Extension of existing service 300 or similar into the Site	agreement with the operator. This existing bus service will be re-routed into the Site from 2100 th dwelling occupations. It will provide access to the Neighbourhood Centre from the Sullivan Drive bus gate and the A264. All routes will operate on a limited stop basis but would be available to the general public for travel. This route is subject to the delivery of the bus gate to Woodcroft Road and agreement with the operator.	Developer/bus operator
Travel welcome packs, which will include: voucher cycling/walk maps and public transport information amongst other information.	At first occupation	Developer/ TPC
Community travel notice-board	On completion of community facilities	TPC
Community website	By first occupation	TPC
Bicycle user group / buddy scheme	By first occupation	TPC
Promote the Council's online cycle journey planner	By first occupation	TPC
The school is to produce a School Travel Plan	Prior to occupation of the school development	TPC (with assistance from a school representative)
Taxi Rank (to be provided at rail station if station is delivered)	Integrated in design on completion of railway station	Developer
REDUCING THE IMPACT OF CARS		
Measure	Implementation	Responsibility
Highways safety / traffic calming measures (based on 'home zone' principles)	Integrated in design	Developer
Site speed limits of 20mph and below	Integrated in design	Developer
Indirect traffic routeing in comparison to pedestrian, cycle and public transport routes	Integrated in design	Developer
Delivery of a 'managed' vehicle site exit controlled by signals and providing bus priority	Integrated in design	Developer
Signage for pedestrians and cyclists	Integrated in design	Developer
Promote the County Council's Car Share Scheme (www.westsussexcarshare.com)	At first occupation	TPC
Investigate the opportunity for a car club, and if viable, work with operator to establish.	Before 500 th occupation	TPC
Investigate the opportunity for a Brompton Bicycle Hire facility at the rail station (if delivered).	Integrated in design on completion of railway station	Developer/ TPC

*Diversion of existing services in to the Site will be subject to the agreement of the existing operating companies – a degree of subsidy may be required to encourage bus operators to extent services into the site during the early years.

Table 12: Proposed Travel Planning Measures

- 7.2.2. It is evident from the table above that a comprehensive list of possible measures is proposed in order to ensure the TP targets are met.
- 7.2.3. The masterplan has been developed to facilitate ease of movement by walking, cycling, bus and rail. A network of foot/cycleways is planned including a priority route, creating a central spine north-south through the development. Bus gates will provide direct and priority links into and out of the site for bus services. The possible railway is located along the central spine close to the mixed use centre. The streets are designed to allow bus services to penetrate the site along routes unobstructed by cars. Streets with higher traffic flows include

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segregated cycleways and streets with lower flows will be planned to give priority to non-car modes. Traffic calming will be integral to the design of the streets.

- 7.2.4. This approach is complemented by the provision of a range of 'soft' measures that predominantly aim to further encourage the uptake of sustainable modes by residents, visitors, and employees of the development.
- 7.2.5. There are numerous measures that are proposed, which would improve information on the sustainable travel opportunities available on site. Travel Welcome Packs will be issued to all new residents of the site. These packs will include information such as: walk/cycle maps; public transport information; contact information for local cycle providers/repairers; literature on the health benefits of walking/cycling; details of local food retailers providing home delivery; information on location of electric vehicle charging points; and information on future local sustainable travel events. A voucher to the value of £100 will be included with each welcome pack. The voucher will entitle each household to any of the following (or similar):
- a. A contribution towards the purchase of an adult bicycle or
 - b. A bus season ticket to the value of £100 or
 - c. A rail season ticket to the value of £100 or
 - d. A WSCC concessionary bus fare discount card for 5-19 year olds (Your 3-in-1 Card) which costs £50.
- 7.2.6. In addition, the developer will set aside a maximum budget of £10,000 for cycle training courses such as WSCC's Bikeability training for adults and children up to level 3, which will be offered to residents on a first come first served basis. In order to improve attendance, residents would pay a 50% contribution towards the training. This should also ensure that as many residents as possible are able to take up the training.
- 7.2.7. The welcome packs will include details about any relevant and available local School Travel Plans and workplace Travel Plans (e.g. easitCRAWLEY/Manor Royal, Gatwick Airport, Crawley Borough Council, Horsham District Council, West Sussex County Council (Horsham) etc).
- 7.2.8. Other measures are proposed to improve accessibility to information, such as Community Travel Notice Boards, and Real Time Information (RTI) equipment.
- 7.2.9. The TPC will investigate the opportunity for a car club, and if viable, will set up a scheme or work with an operator to establish a scheme. In order to improve viability, the TPC will consider resident donated cars or the purchase of a second hand vehicle.
- 7.2.10. In terms of innovation, the key measure being proposed for the site is the delivery of Real Time Information Screens at bus stops, employment areas, retail areas, and local community facilities. This will provide 'live' up-to-date public transport information which will benefit residents, employees, and visitors in neighbourhood centre.
- 7.2.11. The combination of 'hard' and 'soft' measures is considered to provide significant potential to positively influence travel behaviour, and offer the optimum opportunity to enable residents, employees, and visitors to travel by sustainable modes, and ensure that they meet the targets identified in Section 6.
- 7.2.12. This approach should result in meeting the targets set out in Section 6, however, if any of the targets are not met within the specified time period, a number of additional measures can be considered for implementation. These are discussed in greater detail within Section 10.

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- 7.2.13. The school Travel Plan will be prepared and agreed with WSCC prior to occupation of the school. This will include a site location plan. A School Safety Zone will be provided around the school encouraging drivers to travel at 20mph at pick up and drop off times.

8 Implementation Plan

8.1 Introduction

- 8.1.1. An implementation plan developed to sets out commitments and timescale to appoint a TPC, deliver proposed measures, commission surveys for monitoring, and if required the implementation 'Supplementary Enforcement' travel planning measures.

8.2 Strategy

- 8.2.1. The overall objective of the implementation plan is to build a strong basis for the TP through good infrastructure measures, a robust policy framework and a site "image" in favour of sustainable transport. The strategy is summarised below:

- Ensure site infrastructure is well configured for sustainable modes;
- Policy commitment is embedded in sustainable modes on the site;
- Create a robust image and profile of TP on site amongst residents, employees, and visitors;
- Introduce visible schemes with practical benefits;
- Ensure delivery of proposed travel planning measures, and further 'Supplementary Enforcement' measures if required.

8.3 Implementation Plan

- 8.3.1. The implementation plan includes measures/actions required prior to first occupation and during the phased construction of the development.

Kilnwood Vale
Travel Plan

Task	Details	Proposed timescale for Implementation
Appointment of TPC	Responsible for promoting and marketing the TP and implementing measures	No Occupations can occur until a Travel Plan Coordinator is appointed by Crest and his or her contact details are provided to the County Council
Establishment of a TP forum	Six monthly meetings or as otherwise agreed by forum.	To be set up following appointment of TPC.
Delivery of Proposed Travel Planning Measures	Measures listed in Table 12	Measures will be implemented as set out in Section 7
Surveys and Monitoring	Travel Surveys to be undertaken to determine the travel patterns of residents / employees on the site, which will influence any amendments / refinements required to the TP.	See Table 14
Implementation of Supplementary Enforcement Measures (if required)	Additional TP measures will be proposed if not on course to meet targets	As and when the TPC determines that the annual surveys identify that targets are not met.
Review of TP performance	The targets will be reviewed following the annual surveys and approved with the TP Advisor at WSCC.	The review will follow the qualitative and quantitative data collection undertaken on site until 10 years after commencement.

Table 13: Implementation Plan

9 Management & Monitoring

9.1 Introduction

9.1.1. Following the identification of measures and the implementation plan, this Section focuses on the ongoing management and co-ordination of the TP, and the proposed monitoring programme.

9.2 Travel Plan Co-ordinator

9.2.1. No Occupations can occur until a Travel Plan Coordinator is appointed by Crest and his or her contact details are provided to the County Council.

9.2.2. The Travel Plan Coordinator appointed by Crest must remain in post for the 10 year Travel Plan Period. This may be an appointment from within Crest's staff or a transport consultant appointed by them. The appointment will be part time but the Nominated Travel Plan Co-ordinator should be "on call" when needed.

9.2.3. The tasks of the TPC will include:

- Establishing and running the TP Forum;
- Managing the delivery of the proposed initiatives/measures;
- Commissioning baseline data collection of travel characteristics;
- Review preliminary targets based on outcomes and analysis of baseline data. This will be reviewed and updated in consultation with WSCC as required;
- Communication, engaging, and consulting residents;
- Implementation of measures/initiatives set out in Section 7;
- Arranging the commissioning of the agreed monitoring surveys of the TP;
- Analysing the monitoring outputs and data, and undertaking 'Annual Monitoring Reports' as set out in WSCC Development Travel Plan Policy; and
- Implementing the Supplementary Enforcement Measures, if the agreed targets have not been met in the agreed timescales (see section 8).

9.2.4. The TP forum will meet ever six months unless otherwise agreed. The following representatives will be invited: WSCC travel plan co-ordinator, Horsham Borough Council, Crawley District Council, local resident representative, bus operator, Countryside Access Forum for West Sussex (CAFWS).

9.3 Monitoring

9.3.1. The monitoring of the TP is vital to its success. The monitoring process will also determine its effectiveness and whether any of the Supplementary Enforcement Measures are needed.

9.3.2. It is proposed that both qualitative and quantitative data should be collected at the development in order to fully understand the travel patterns and behaviour and the effects and benefits of the proposed travel planning measures.

Kilnwood Vale
Travel Plan

- 9.3.3. In terms of qualitative data collection, travel surveys will be undertaken at the agreed intervals, in the form of a web-based or postcard travel surveys. This will help to understand travel patterns and behaviour from an early stage.
- 9.3.4. It is proposed that quantitative data will be collected in accordance with Table 14. This will comprise TRICS SAM monitoring and/or Automated Traffic Counters (ATCs).
- 9.3.5. WSCC Development Travel Plan Policy indicates that they require monitoring in accordance with the TRICS UK Standard Assessment Methodology (SAM), a maximum auditing fee of £500 will be offered to WSCC per TRICS SAM survey to monitor progress of the Travel Plan. This cost will be reduced by 25%, if the surveys show the Travel Plan is on track to achieve its targets.
- 9.3.6. In addition to the TRICS SAM monitoring (12 hour survey 7am to 7pm), it is also proposed that Automated Traffic Counters (ATC's) will be implemented at the site access, which will further inform the level of vehicle trips generated by the development. The counter would be in place on a permanent basis, following the completion of the Initial Travel survey.
- 9.3.7. The proposed programme for monitoring is shown below:

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Travel Survey			✓		✓			✓			✓					✓
TRICS											✓					✓
ATC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 14: Monitoring Programme

9.4 Review

- 9.4.1. Monitoring Reports will also be prepared on the completion of Phases 3, 4 and 5 and then every other year until five years after completion. These will be based on the latest survey data collected. These will include:
- Analysis of Survey data (i.e. TRICS SAM surveys, Travel Surveys, ATC data)
 - Progress made in implementing TP measures and initiatives
 - Progress made in meeting TP targets
 - Determination of any Supplementary Enforcement Measures, if required

10 Supplementary Enforcement Measures

10.1 Introduction

- 10.1.1. The Travel Plan objectives have fundamentally influenced the masterplan and transport strategy for the development at Kilnwood Vale. Commitment has been made to deliver a wide range of sustainable measures as early as possible, providing new residents with opportunity not to travel (out of the development), walk, cycle, use the bus or rail services. It is considered that this will deliver the optimum opportunity to reduce single occupancy car use at a time when residents are making a lifestyle change and more greatly influenced.
- 10.1.2. The TP will be monitored throughout the phased construction of the development through a combination of TRICS SAM surveys, travel surveys, and permanent ATCs within the site, as discussed in Section 9.
- 10.1.3. Over the course of this monitoring period, the performance of the TP will be assessed against the targets identified in Section 8. If these targets are met, no further action will be required. However, if it is considered that the targets are not met, then Supplementary Enforcement Measures may be required.
- 10.1.4. The Supplementary Enforcement Hierarchy approach has been taken, which is set out within the WSCC Development Travel Plan Policy. This encourages the implementation of on-site travel planning measures as a priority. The Supplementary Enforcement Measures identified below reflect this approach.

10.2 Supplementary Enforcement Measures

- 10.2.1. A number of additional 'Supplementary Enforcement' measures have been determined which could be implemented, if specific targets are not met. These include:

Measure	Responsibility
Community travel events e.g. walk/cycle promotion events	TPC
Enhanced community travel web site	TPC
Personalised Travel Planning through enhanced website	TPC
Establish a car share scheme or provide links to existing car share initiatives	TPC
Provision of Cycle Training	TPC
Demand Management measures at Site Exits through reduction in green time at the traffic signals	TPC

Table 15: Supplementary Enforcement Measures

- 10.2.2. The TPC can select the most appropriate Supplementary Enforcement Measures to meet the targets.

PART 2 ESSENTIAL TRAVEL PLAN OBLIGATIONS

Travel Plan Measures (to be implemented by the First Owner or its Travel Plan Co-ordinator):

- Establishing and running the Travel Plan Forum to be held at least every 6 months
- Managing the Travel Plan budget to enable delivery of the proposed initiatives/measures
- Undertaking baseline data collection of travel characteristics
- Review preliminary AM, PM and 12 hour Car Driver Targets based on outcomes and analysis of baseline data
- Preparation and distribution of Welcome Travel Packs including a £100 voucher towards the purchase of a bicycle, bus season ticket or rail season ticket
- Communication, engaging, and consulting residents
- Implementation of measures/initiatives set out in Travel Plan
- Arranging the commissioning of the agreed monitoring surveys of the Travel Plan
- Analysing the monitoring outputs and data, and undertaking 'Annual Monitoring Reports' as set out in WSCC Development Travel Plan Policy
- Implementing additional 'back up' measures, if the agreed Car Driver Targets have not been met in the agreed timescales.
- Installation of Real Time Passenger Information points at all bus stops within the Development, in the Neighbourhood Centre
- Establishing a community web site including travel information and bus and rail timetables and to work together with the County Council and the Bus Operators to establish if reasonably practicable a link providing real time information on the bus services to the Site
- The following additional Travel Planning measures to be investigated and progressed where viable: A car club; a bicycle hire facility and a public electric vehicle charging point

**SCHEDULE 3
COUNTY COUNCIL COVENANTS WITH THE OWNERS**

1. In consideration of the obligations on the part of the Owners contained in this Deed the County Council for itself and any successor to its statutory powers hereby covenants with the Owners as follows
- 1.1 that following receipt of any payment pursuant to this Deed as identified in column 1 of the following table it shall invest the same in an interest bearing account and thereafter only apply the same (and any interest earned thereon and acting reasonably) towards the objects identified in the corresponding column 2 of the following table and in relation to directly related expenditure reasonably incurred in relation there to and for no other purpose and the payments received shall be held on trust for the benefit of the persons from whom they were received pending their expenditure on the matters hereby authorised

COLUMN 1 - PAYMENT UNDER THIS DEED	COLUMN 2 - OBJECTS TO WHICH CONTRIBUTION SHALL BE APPLIED
First Secondary Education Contribution	Towards the Stage 1 Secondary School Extension Works
Second Secondary Education Contribution	Towards the Stage 2 Secondary School Extension Works
Cheals Junction Contribution	Upgrade of existing roundabout to a fully signalised junction with potential to deliver bus lanes east-bound towards the Town Centre. The design includes pedestrian crossing facilities on the Horsham Road eastern arm, as illustrated on Drawing 16702 – 043 Rev B or such other scheme at Cheals Junction that the County Council determines as being appropriate to mitigate the effects of the Development
Sullivan Drive Junction Contribution	Upgrade of roundabout to fully signalised gyratory scheme, as illustrated in Drawing 16702-071 or such other scheme that the County Council determines as being appropriate to mitigate the effects of the

COLUMN 1 - PAYMENT UNDER THIS DEED	COLUMN 2 - OBJECTS TO WHICH CONTRIBUTION SHALL BE APPLIED
	Development
Resources Centre Contribution	Towards the provision of a Resources Centre if not provided as part of the Community Building within the Neighbourhood Centre

PROVIDED ALWAYS THAT following completion of the works identified any unexpended balance may be applied by the County Council towards the provision of additional school places for sixth form children from the Development

- 1.2 If requested to provide the Owners with an annual statement of all monies including interest held in the accounts referred to in paragraph 1.1 and provide a written account together with receipts detailing the nature of any expenditure from the said accounts and the specific projects to which the monies shall have been applied
- 1.3 If the County Council shall not have expended the whole of any contribution together with all accrued interest for the purposes specified above within a period of five years from the date of receipt of the last instalment thereof the County Council hereby undertakes to refund to the person from whom it was received the unexpended balance of that contribution together with interest accrued thereon.
- 1.4 To co-operate at all times with each other and with the Owners the Highways Agency and the District Council in relation to the early implementation of the Development and the facilities contained therein
- 1.5 Wherever necessary and appropriate to consider the use of its statutory powers in order to assist the early implementation of the Development and the facilities contained therein and the early construction and opening to traffic of the Kilnwood Village
- 1.6 Not to unreasonably withhold or delay any consent authority or approval sought or required by any person under this Agreement

SCHEDULE 4 BUS SERVICES

Route 1 - Shuttle Bus: a limited stop service shuttle bus service between Dorsten Square and the Site via the A264 which shall be maintained by the Owner for a period of 5 years from the 50th Dwelling Occupation or until a local bus service shall have been diverted into the Site (if later)². The type of bus used shall be a Mercedes Sprinter or similar vehicle.

Route 2 - Extension of existing Fastway Service or similar service into the Site³: this existing bus service will be re-routed into the Site and provide access to the Neighbourhood Centre from the Sullivan Drive bus gate and the A264. The proposed route is illustrated in Figure 1. This route is subject to agreement with the operator.

Route 3 – Diversion of existing services 23/24 through the Site³: this existing bus service will be re-routed into the Site and provide access to the Neighbourhood Centre from the Sullivan Drive bus gate and the A264. The proposed route is illustrated in Figure 1. This route is subject to agreement with the operator.

Route 4 - Diversion of existing service 200³: this existing bus service will be re-routed into the Site and provide access to the Neighbourhood Centre between Sullivan Drive bus gate and the A264. This route is subject to agreement with the operator.

Route 5 - Extension of existing service 300 or similar into the Site³: this existing bus service will be re-routed into the Site and provide access to the Neighbourhood Centre from the Woodcroft Drive bus gate and the A264. The proposed route is illustrated in Figure 1.

PROVIDED ALWAYS THAT all routes will operate on a limited stop basis but would be available to the general public for travel and are subject to agreement with the operator.

The tables below set out the proposed frequencies of the bus routes from the trigger point and for five years after this point.

The owner shall if necessary and proven to be required provide an element of subsidy in order to encourage the bus operators to provide extended services involving additional buses for the above services into the Site until additional patronage results in the extended services becoming self-financing. Services which are simply diverted into the Site will not require subsidy.

Subject to agreement of the bus operating companies the Owner shall procure the operation of the shuttle bus service no later than occupation of the 50th Dwelling and shall seek to procure the service diversions by the target levels of Dwelling occupations identified below:

² It is anticipated that the shuttle bus should be well subscribed from the outset and as population builds up it should not take long for this service to be fully subscribed. Once the first shuttle bus becomes self-funding then further additions to the service can be made.

³ Diversion of existing services into the Site will be subject to the agreement of the existing operating companies - a degree of subsidy (this being limited to a maximum of 5 years for each relevant service as per the JAAP) may be required to encourage bus operators to extend existing services into the site during the early years.

Bus Service Delivery Table

Route / Service diversion	Target Level
Route 1 service level (a)	● Already implemented at the date of this Agreement
Route 1 service level (b)	● 9 th Dwelling Occupation
Route 2	● 609 th Dwelling Occupation (100 th Dwelling of Phase 3)
Route 3	● 609 th Dwelling Occupation (100 th Dwelling of Phase 3)
Route 4	● 1359 th Dwelling Occupation (100 th Dwelling of Phase 4)
Route 5	● 1809 th Dwelling Occupation and on completion of Woodcroft Road bus gate (completion of Phase 4)

Table – Route Frequencies (minutes)

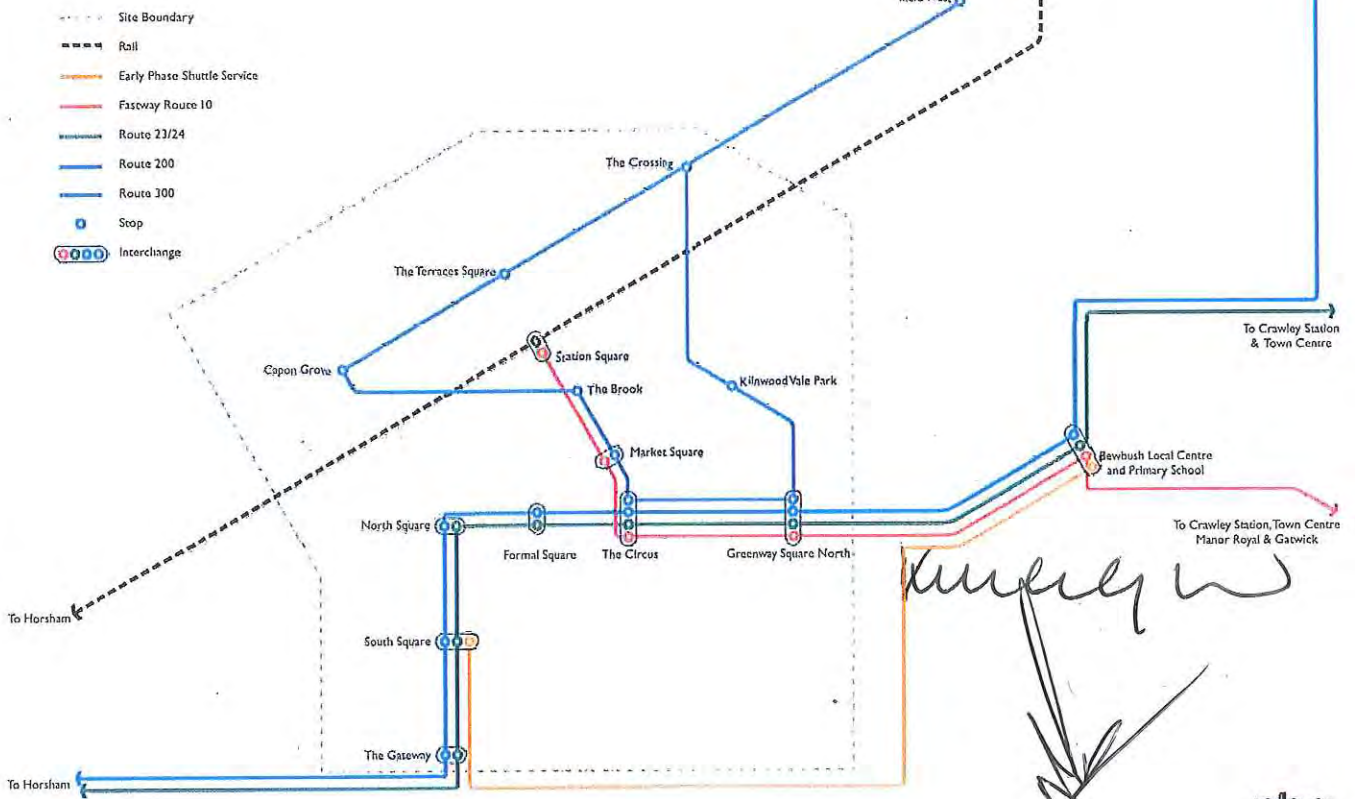
	Monday - Friday			Weekends and bank holidays
	Peaks (0630-0900 & 1630-1900)	Daytime (0900-1630)	Evening (1900-0000)	Daytime (0630-2000)
Route 1 service level (a)*	20 minutes	40 minutes	no provision	40 minutes
Route 1 service level (b)	20 minutes	20 minutes	40 minutes	40 minutes
Route 2	As existing	As existing	As existing	As existing
Route 3	As existing	As existing	As existing	As existing
Route 4	As existing	As existing	As existing	As existing
Route 5	As existing	As existing	As existing	As existing

Or as otherwise agreed. If the above service provision timetable results in an underuse / utilisation the frequency should be reduced to meet the need and by agreement .

	Early in Phase 2 Occupation of 9 th Dwelling	Early in Phase 3 Occupation of 609 th Dwelling	Early in Phase 4 Occupation of 1359 th Dwelling	By completion of Phase 4 before the Occupation of 1809 th Dwelling
Small Private Shuttle Bus	Service Level (b)			
Fastway service 10			three vehicles	
Conventional Bus- Service 23/24			Diverted, no subsidy	

		Early in Phase 2 Occupation of 9 th Dwelling	Early in Phase 3 Occupation of 609 th Dwelling	Early in Phase 4 Occupation of 1359 th Dwelling	By completion of Phase 4 before the Occupation of 1809 th Dwelling
Conventional Bus- Service 200				Diverted, no subsidy	
Conventional Bus- Service 300					Two vehicles

West of Bewbush Public Transport Routes



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Figure 1

**SCHEDULE 5
PAYMENT TABLE**

This Payment Table sets out the proposed delivery mechanism, trigger points, cost of the scheme and funding contribution for the off-site highway works required in relation to the West of Bewbush planning application and to be undertaken by or procured by the County Council.

Contribution and amount	Junction Name	Trigger Point	Index and base date/base value
Cheals Junction Contribution £1,946,902	Cheals Junction Stage 2 Improvements	Occupation of the 1809 th Dwelling - if Monitoring as described in Schedule 6 demonstrates these works are not needed this contribution may instead be applied towards other highway or transport improvements that may be required to mitigate the impact of the development on the surrounding highway network.	BCIS/at 17 th October 2011
A264 Sullivan Drive Junction Contribution £483,159	A264/A220/Sullivan Drive Junction Improvements –	Contribution is subject to Monitoring. If a contribution towards the improvement of Sullivan Drive is required under the provisions of Sub-Clause 8.10, a contribution will be made 56 days after completion of Monitoring **	BCIS/ at 17 th October 2011the

**SCHEDULE 6
HIGHWAY IMPROVEMENTS**

**TO BE UNDERTAKEN BY OR (In RESPECT OF ITEMS 3 and 4 only) THE SUBJECT OF
CONTRIBUTIONS FROM THE DEVELOPER
THUMBNAIL SPECIFICATIONS⁴**

1. Secondary Access Works

Description – The creation of a secondary/construction access on the A264, between Sullivan Drive junction and the Main Access Works as shown for the purposes of illustration on drawing 16702/441/R04/03 Rev B and which access arrangements shall provide a signalised left in, left out right out access and egress to the Site and integrated pedestrian, cycle and equestrian crossing.

2. Cheals Junction Stage 1 Works

Description – Improvements to the slip road at the A2220 approach to Cheals Roundabout to deliver two lane approach to the existing roundabout, as shown for the purposes of illustration on Drawing 16702-010-022A Rev B. These Works form Stage 1 of the full improvements at the junction.

3. Cheals Junction Stage 2 Works (Developer Contribution see Schedule 5)

Description – Upgrade of existing roundabout to a fully signalised junction with potential to deliver bus lanes east-bound towards the Town Centre. The design includes pedestrian crossing facilities on the Horsham Road eastern arm, as illustrated on Drawing 16702 – 043 Rev B or such other scheme that the County Council determines as being appropriate to mitigate the effects of the Development.

4. Possible Signalised Gyratory at Sullivan Drive Junction (Developer Contribution depending on monitoring see Schedule 5)

Description – Upgrade of roundabout to fully signalised gyratory scheme, as illustrated in Drawing 16702-071

or such other scheme that the County Council determines as being appropriate to mitigate the effects of the Development.

Trigger - The need for the junction improvements will be monitored and reviewed after the commencement of phase 4 (860th Dwelling) and until Completion of the Development.

Monitoring will involve the installation an automatic traffic counter, use of a permanent counter or other agreed method to survey the traffic flows at:

⁴ All highway improvements to be contained within highway limits or land within the ownership or control of the Owners

- the main site access
- the secondary site access
- the A264 east-bound approach to Sullivan Drive roundabout
- the A264 west-bound exit from Sullivan Drive roundabout

The counters should be installed for a minimum of a week to collect typical traffic flows*. The surveys will be provided to WSCC annually from occupation of the 860th Dwelling.

Ref.	Location	AM Peak Hour (08:00 – 09:00)	PM Peak Hour (17:00 – 18:00)
1	Site Access	1046 vehicles (two-way)	1146 vehicles (two-way)
2	A264 (west of Sullivan Drive)	5098 vehicles (two-way)	4726 vehicles (two-way)
3	Development traffic at A64 approach (west of Sullivan Drive)	729 vehicles (two-way)	537 vehicles (two-way)

Note: Development flows includes affect of Travel Planning as agreed with WSCC

If traffic flows at the site access (1) and A264 approach (2) reach the triggers outlined in the above table in either peak hour, then a registration matching survey will be undertaken between the site access and the A264 western approach/exit to the Sullivan Drive roundabout. This will determine whether the development traffic at the western A264 approach (3) reaches the third trigger outlined in the above table.

A contribution will be made if the triggers (1, 2 and 3) are all met and the 1809th Dwelling is Occupied.

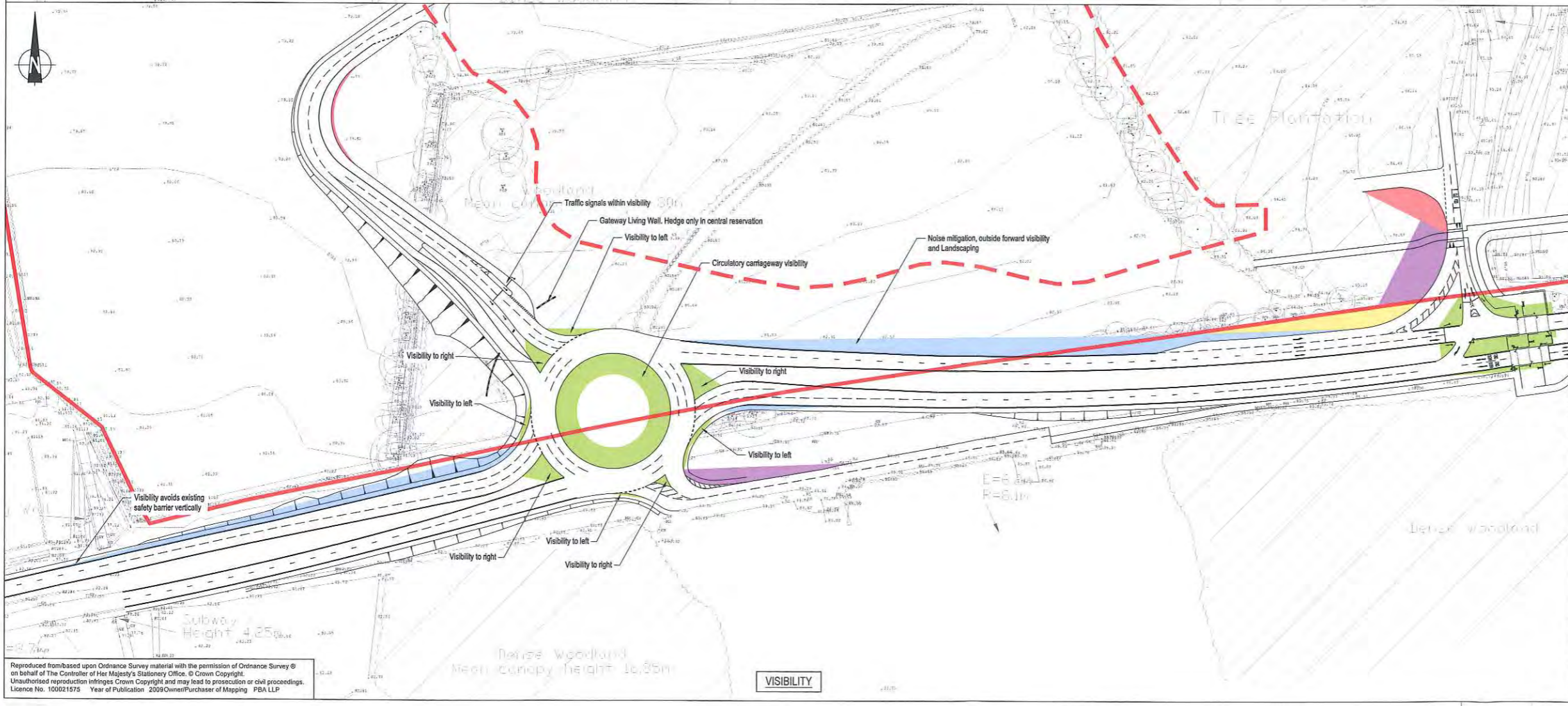
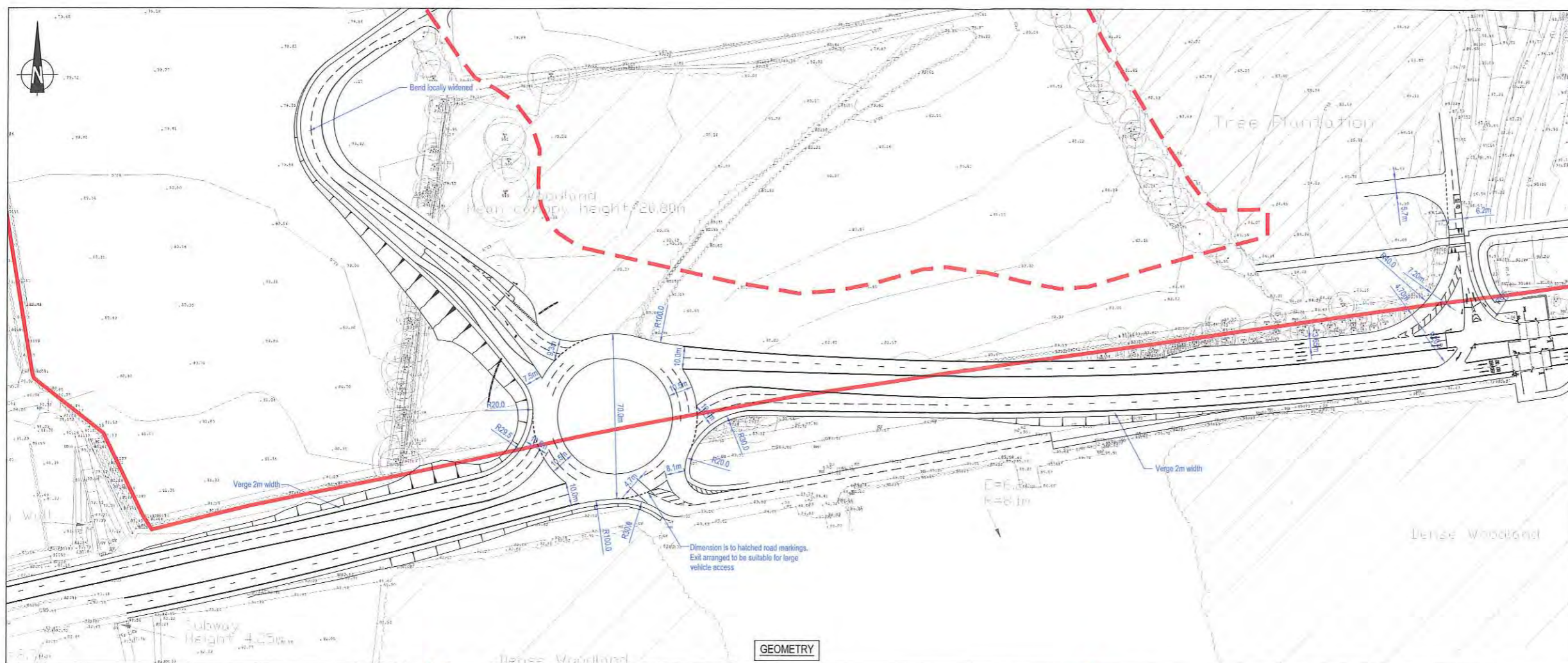
5. Sullivan Drive Bus Gate

Description – Route connecting site to Sullivan Drive for bus services, pedestrians and cyclists, as illustrated in Drawing 16702-010-031 Rev B. Design to be agreed with the County Council as highway authority. The proposal is intended to be delivered in conjunction with Phase 3 of the Development and prior to the 609th Dwelling Occupation.

6. Woodcroft Road Bus gate

Description – Route connecting site to Woodcroft Road for bus services, pedestrians and cyclists, as illustrated in Drawing 16702-037 Rev B. Design to be agreed with the detailed planning application of Phase 4 and prior to the 1359th Dwelling Occupation

*Typical traffic flows – Surveys should be undertaken outside holiday periods, events days, sever weather conditions or when significant Roads Works may cause disruption. Surveys should, where possible, be collected during a neutral month (April, May, June, September and October).



Key:

- 295m forward give way line visibility for 70mph - desirable minimum (TD-9/93)
- 90m forward visibility for 30mph - desirable minimum (TD-9/93)
- Other forward visibility for 20mph including bonnet allowance (Manual for Streets)
- Junction visibility
- Visibility required to 30mph limit
- Development boundary
- - - Phase 1 development boundary

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Mark	Revision	Drawn	Date	Chkd
B	Gateway wall feature amended.	RGM	03.02.11	SJB
A	Footpath and bridleway arrangement shown.	RGM	26.07.10	SJB

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Drawing Issue Status: **APPROVAL**

**KILNWOOD VALE, CRAWLEY
 DESIGN STATEMENT: A264 ACCESSES
 PRIMARY AND SECONDARY ACCESSES
 GEOMETRY & VISIBILITY**

Client: **Crest NICHOLSON**

Date of 1st Issue: 09.06.10	Drawn by: JW
AT Scale: 1:1000	Checked by: SJB
Drawing Number: 16702/441/R04/03	Revision: B

pba peterbrett

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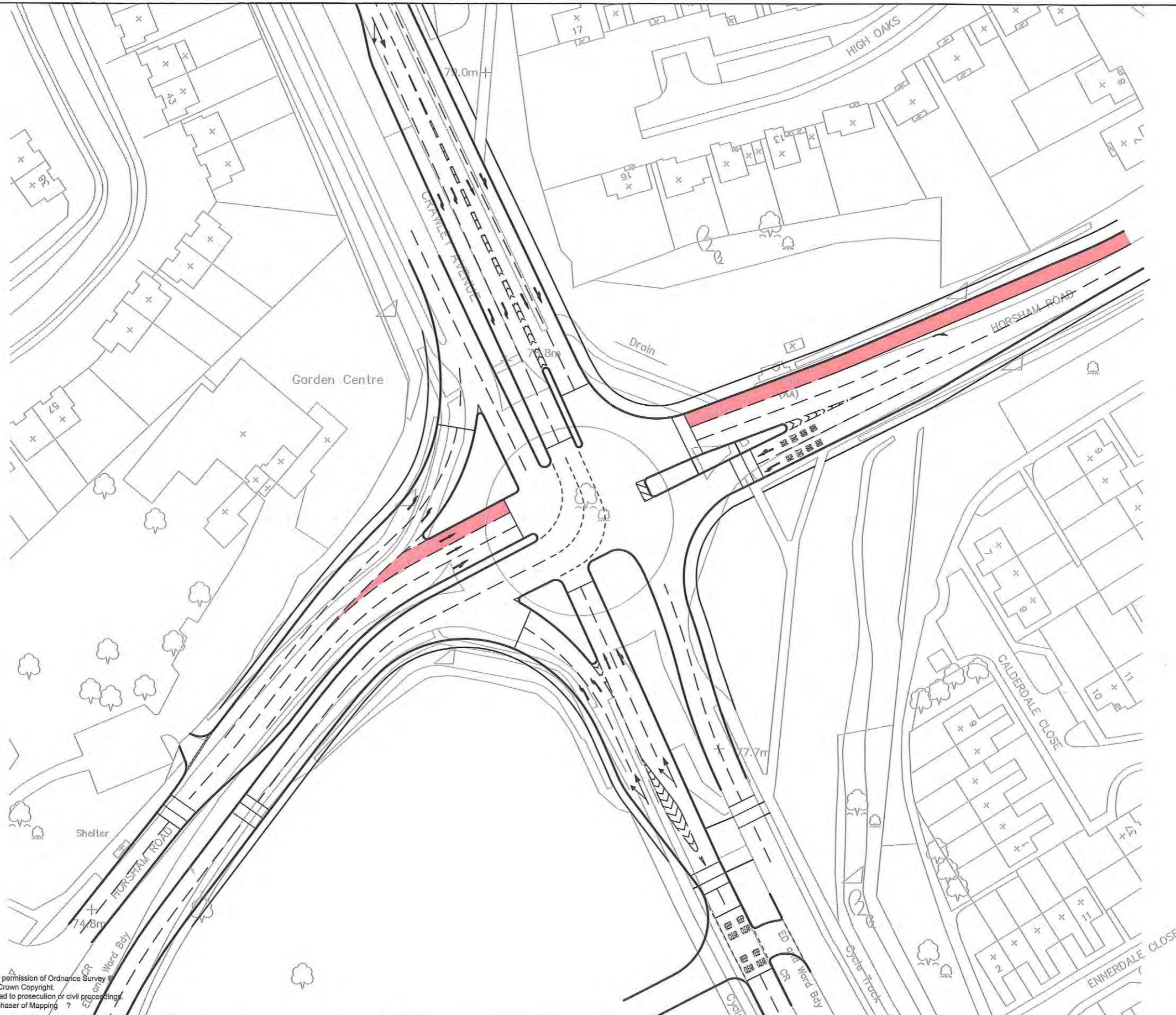
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Kilwood Vale
A220 / A23 Slip Road Improvements

B	Alteration to segregated left turn lane	GS	21.07.10	SM
Mark	Revision	Drawn	Date	Chkd
Drawing Status		CONCEPTUAL DESIGN		
Date of 1st Issue	10/10/07	Drawing Number	Revision	
A3 Scale	1:1000	16702 / 022A	B	
Drawn by	DH			
Checked by				



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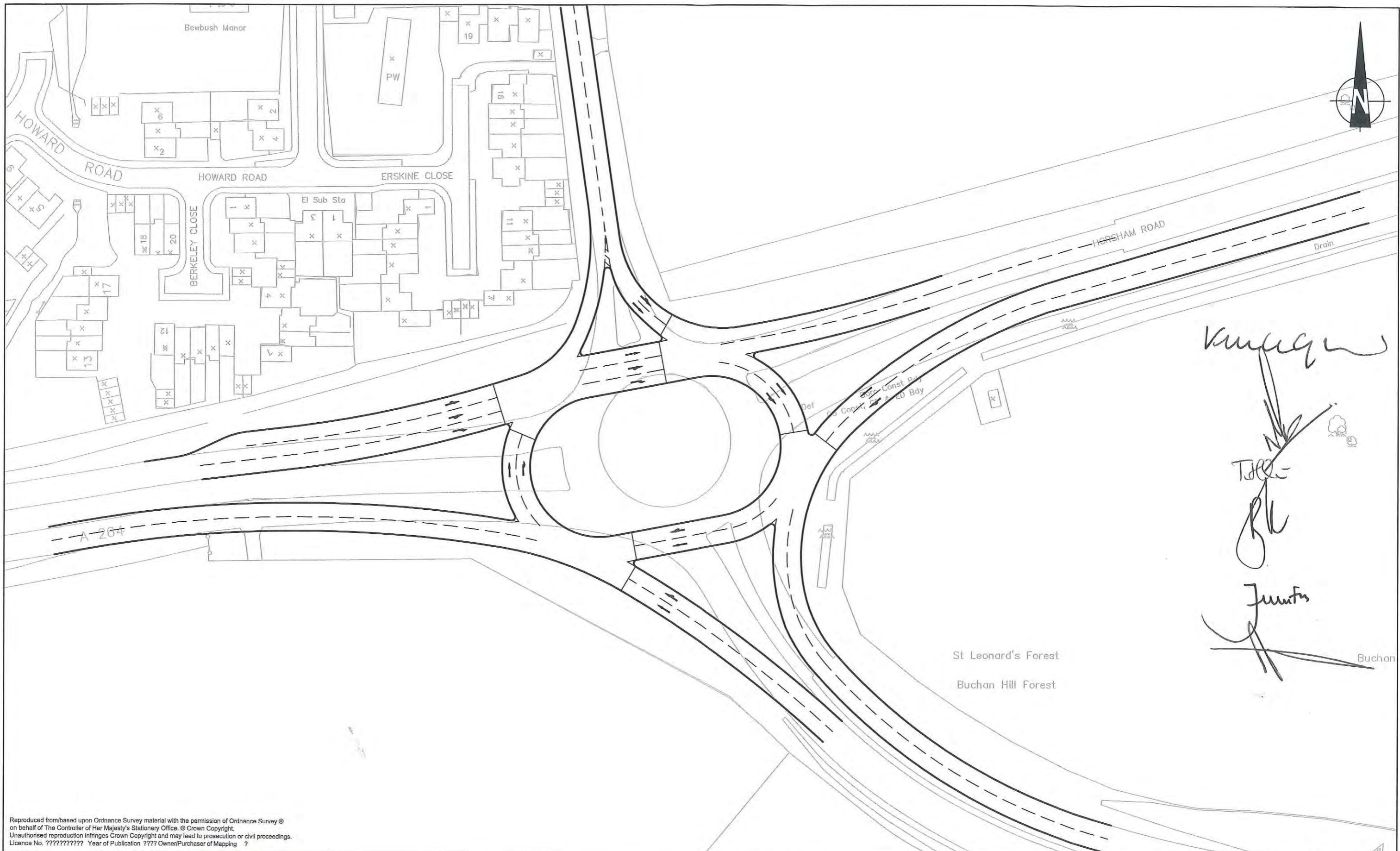
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Kilnwood Vale
 Full Signalisation of A23/A2220

Mark	B	Layout Alterations to segregated left turn lanes	GS	21.07.10	SM
Revision			Drawn	Date	Chkd
Drawing Status		CONCEPTUAL DESIGN			
Date of 1st Issue	18.03.08	Drawing Number	Revision		
A3 Scale	1:1000	16702 - 043	B		
Drawn by	DH				
Checked by					




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Kilnwood Vale
Possible Signalised Gyratory at Sullivan Drive / A264 Junction

Mark	Revision	Drawn	Date	Chkd
Drawing Status				
CONCEPTUAL DESIGN				
Date of 1st Issue	06.02.08	Drawing Number	Revision	
A3 Scale	1:1000	16702 - 071	-	
Drawn by	GS			
Checked by				



KEY			
	LAND REQUIRED FOR PURCHASING		
	INTERVISIBILITY SPLAY		
	FORWARD VISIBILITY SPLAY (MANUAL FOR STREET 30MPH)		

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Kilwood Vale
Sullivan Drive Bus Gate

B	AMENDMENTS TO KERBLINE FOR RISING BOLLARD	GS	11.10.10	SM
Mark	Revision	Drawn	Date	Chkd
Drawing Status				
CONCEPTUAL DESIGN				
Date of 1st Issue	31/01/08	Drawing Number	Revision	
A3 Scale	1:500	16702 - 031	B	
Drawn by	DH			
Checked by				



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Client



Kilnwood Vale
Woodcroft Road Bus Gate

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

B	Amendments to Kerb Alignment	GS	13.10.10	SM
A	Addition of Rising Bollard of Bus Gate	GS	13.10.10	SM
Mark	Revision	Drawn	Date	Chkd
Drawing Status		CONCEPTUAL DESIGN		
Date of 1st Issue	30.01.08	Drawing Number	Revision	
A3 Scale	1:500	16702 - 037	B	
Drawn by	DH			
Checked by				

**SCHEDULE 7
NOTIONAL DWELLING MIX**

(This table is to be used for the purposes of calculating the First and Second Secondary School Contributions)

In order to calculate the First and Second Secondary Education Contributions for the purposes of this Deed the WSCC Calculator shall be applied to the dwelling numbers appearing in the second column of the following dwelling mix table on the assumption that all such dwellings are Market Dwellings:

DWELLING MIX TABLE

Unit type	Resulting notional market dwellings to be included in WSCC Calculator after 30% discount for Affordable Housing
1 bed flats	no contribution for 1 bed units
2 bed flats	219 dwellings
2 bed houses	297 dwellings
3 bed houses	560 dwellings
4 bed houses	280 dwellings
5 bed houses	175 dwellings

**SCHEDULE 8
WEST SUSSEX FIRE BRIGADE GUIDANCE NOTES**

WEST SUSSEX FIRE & RESUCE SERVICE

Guidance Note: The Provision of Fire Hydrants and an Adequate Water Supply for Fire Fighting

1.0 Water Undertakers

The water undertakers in the County are as follows:

Portsmouth Water Company
Southern Water Authority - incorporating Hardham Brighton and Worthing
South East Water
Sutton and East Surrey Water Company

2.0 Hydrants

Hydrants will be installed if required, in the following circumstances:

- i) when new water mains are laid
- ii) to cover new building development and
- iii) where fire risk is increased

2.1 Hydrants on New Mains

Water undertakers are required to notify the Fire Authority of proposals for new water mains. Details of such proposals are sent to Brigade Headquarters usually in plan form

2.2 New Hydrants on Existing Mains

Water undertakers are required to notify the Fire Authority of proposals for replacements if existing mains. The need may arise to provide additional hydrants where there has been new building development or where existing supplies have become inadequate

2.3 Location and spacing of Hydrants

Fire Hydrants should be sited in positions to be agreed by the Fire Authority and, where possible, such locations will be at main roads, feeder roads or road junctions where they are readily visible

Although no statutory distance is laid down for the spacing of hydrants, the distribution of hydrants relates to the location and degree of risk in accordance with the following general guidelines:

- I Residential (to include Sheltered Housing)

Approximately 360 metres apart

In effect, up to 350 metres apart and no more than 180 metres back to a hydrant in cul de sacs etc

II Industrial, Industrial Estate and Associated Risks:

In effect up to 180 metres apart and no more than 100 metres back to a hydrant in cul de sacs but these distances may be reduced in areas subject to higher risk

III Hospitals, Institutions, Hotels etc:

To conform to any relevant Code of Practice. In the absence of such guidance 180 metres and no further back to a hydrant than 100 metres from risk

IV Educational Establishments and Other County Council Premises excepting previously outlined:

To conform to any relevant Code of Practice. In the absence of such guidance 180 metres apart and no further back to a hydrant than 100 metres from risk

V Town Centres, Shopping Buildings, Malls and Other Major Commercial Developments:

To conform to any Code of Practice. In the absence of such guidance, as for Industrial.

VI Rural Areas:

In rural areas, particular attention is paid to specific risks. Therefore, it is not appropriate to indicate a general spacing standard for rural areas

VII Trunk Road and Motorways:

Where distribution systems allow, at 1 km intervals. At service centres (Little Chef, Happy Eaters etc) hydrants should be installed at the access position to the acceleration and deceleration points where they are readily visible

VIII Major Risks:

Such risks are considered individually to ensure that the overall position for fire fighting comprising, as

appropriate, internal water based protection systems, private fire hydrants, statutory fire hydrants and other 'open water' supplies, is adequate.

3.0 Water Supply

3.1 Diameter of Water Mains

Hydrants are to be fitted to water mains of not less than 100 mm in diameter in residential areas and not less than 150mm diameter in industrial and commercial areas.

3.2 Water Pressure

Water undertakers are under a statutory duty to cause the water in such of their water mains as have fire hydrants affixed to them to be laid on constantly and at such pressure as will cause the water to reach the top of the top-most storey of every building in the undertakers area

IN WITNESS of which the parties have duly executed this Deed which is delivered on the date
first before written

SIGNED as a DEED by)
DUNCAN REVOLTA)
In the presence of:)



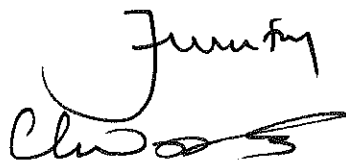
Signature of Witness *Fleming*

Name (in BLOCK capitals): S FLEMING

Address: CREST HOUSE
PYRCROFT ROAD
KT16 9GN

Occupation: ASSIST. COMPANY SECRETARY

SIGNED as a DEED by)
JEREMY COLIN FRY)
In the presence of:)



Signature of Witness

Name (in BLOCK capitals): C. L. WOOLAMS

Address: CREST HOUSE, LIME KILN CLOSE, STOKES GIFFORD
BRISTOL, BS34 8ST

Occupation E. A .

SIGNED as a DEED by
BS PENSIONS TRUSTEES LIMITED
Acting by two Directors or a
Director and the Secretary



Director

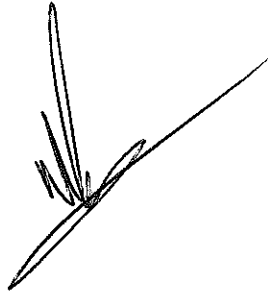


Director/Secretary

EXECUTED as a DEED
by the **HOMES AND COMMUNITIES AGENCY**
acting by:

EXECUTED as a DEED
by **CREST NICHOLSON**
OPERATIONS LIMITED
acting by

Director

A handwritten signature in black ink, consisting of several sharp, upward-pointing strokes followed by a long, sweeping horizontal line that curves upwards at the end.

Director/Secretary

A handwritten signature in black ink, appearing as a series of connected, wavy lines that form a cursive-style name.

THE COMMON SEAL of
WEST SUSSEX COUNTY
COUNCIL was hereunto aff
In the presence of:

Authorised Signatory

SIGNED as a Deed by)
PIERS HENRY CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
RUTH MARGARET CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
JULIAN RICHARD WHATELY)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
HENRIETTA AMELIA CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

DATED 28th April 2016

CREST NICHOLSON OPERATIONS LIMITED

and

PIERS HENRY CALVERT and HENRIETTA AMELIA CALVERT

and

**PIERS HENRY CALVERT and RUTH MARGARET CALVERT AND JULIAN RICHARD
WHATELY AS EXECUTORS OF HENRY CLIFTON CALVERT (DECEASED)**

THE HOMES AND COMMUNITIES AGENCY

and

**TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE
SCHEME**

and

HORSHAM DISTRICT COUNCIL

**DEED OF AGREEMENT UNDER SECTION 106 OF THE TOWN AND COUNTRY PLANNING
ACT 1990**

relating to land

to the West of Bewbush (also known as Kilnwood Vale) in the District of Horsham West Sussex

Planning Ref: DC/15/2813
SEC 2238 and DC/15/2561
Legal Ref PAG 1174/1179
Development Control (North) 15th March 2016 Minute No DCN:115/116

Paul Cummins
Head of Legal and Democratic Services
Horsham District Council
Parkside, Chart Way, Horsham
West Sussex RH12 1RL

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THIS DEED OF AGREEMENT IS MADE THE 28th DAY OF April 2016

BETWEEN:

- (1) **CREST NICHOLSON OPERATIONS LIMITED** (company registration number 01168311) of Crest House, Pycroft Road, Chertsey, Surrey KT16 9GN (the **First Owner**) and
- (2) **PIERS HENRY CALVERT** and **HENRIETTA AMELIA CALVERT** of Holmbush, Faygate, Horsham West Sussex RH12 4SE (the **Second Owner**) and
- (3) **PIERS HENRY CALVERT** and **RUTH MARGARET CALVERT** of Holmbush, Faygate, Horsham West Sussex RH12 4SE and **JULIAN RICHARD WHATELY** of Rathbone Trust Company Limited, 1 Curzon Street London W1J 5JB as the Executors of **HENRY CLIFTON CALVERT** (deceased) (the **Third Owner**)

Parties (1) (2) and (3) collectively referred to as the **Owners**

- (4) **THE HOMES AND COMMUNITIES AGENCY** of Arpley House, 110 Birchwood Boulevard, Birchwood, Warrington, WA3 7QH (the **First Chargee**); and
- (5) **TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE SCHEME** being **DUNCAN REVOLTA** of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA AND **JEREMY COLIN FRY** of 49 Park Grove, Westbury-on-Trym, Bristol BS9 4LG AND **BS PENSIONS TRUSTEES LIMITED** (company registration number 2682277) of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA (the **Second Chargee**)
- (6) **HORSHAM DISTRICT COUNCIL** of Parkside, Chart Way, Horsham, West Sussex RH12 1RL (the **District Council**).

Parties (1) to (6) collectively referred to as the **Parties**

NOW THIS DEED WITNESSETH as follows:

1. **RECITALS**

- 1.1 The First Owner is the registered proprietor with freehold title absolute registered at the Land Registry under Title Number WSX353549 of that part of the Site shaded purple for identification purposes on the Ownership Plan and which the First Owner warrants is free from incumbrances which would prevent the performance of the obligations contained in this Agreement

- 1.2 Title number WSX353549 is subject to registered charges in favour of the First Chargee and the Second Chargee
- 1.3 The Second Owner is the registered proprietor with freehold title absolute registered at the Land Registry under Title number WSX332098 of that part of the Site shaded blue for identification purposes on the Ownership Plan and which the Second Owner warrants is free from incumbrances which would prevent the performance of the obligations contained in this Agreement
- 1.4 The Third Owner are the executors in the estate of Henry Clifton Calvert (deceased) in registered freehold title number WSX287388 and the part of the Site shaded yellow for identification purposes on the Ownership Plan (referred to herein as the "Reserve Land") is within that title
- 1.5 Crest Nicholson (South) Limited has submitted the Application to develop the Site in accordance with the Application
- 1.6 The District Council is the local planning authority for the purposes of the Act for the administrative district of Horsham in which the Site is situate and the Local Planning Authority for the purposes of planning obligations imposed pursuant to the provisions of Section 106 of the Act and by whom the provisions of this Deed relating to the Site are enforceable
- 1.7 The District Council is also a housing authority with responsibility for identifying allocating and bringing forward sufficient housing land to meet housing requirements and for facilitating the provision of affordable housing and is of the opinion that the obligations contained in this Deed are necessary to address the impacts of the Development
- 1.8 In July 2009 the District Council (jointly with Crawley Borough Council) adopted the local development framework entitled "West of Bewbush Joint Area Action Plan (2009) - Development Plan Document" (the **JAAP**) which allocates the Site for a strategic housing development together with related retail employment leisure and open space uses, a new neighbourhood centre and a railway station subject to the requirements to satisfy certain planning obligations arising out of the Development
- 1.9 The JAAP provides a framework for the submission of the Application and the delivery of planning obligations in relation to the creation of a sustainable community on the Site
- 1.10 The Owners have agreed with the District Council to pay the Contributions to carry out certain works and to transfer certain land and to provide the Open Spaces, the SUDs, a Community Building, Neighbourhood Centre, Primary Care Centre, Public Art, Resource Centre, Employment Land and Retail Facilities Land, Railway Station and Car Park Site, a Pavilion and the Affordable Housing in accordance with and subject to the terms and conditions set out in this Deed and further requirements set out in a further agreement with West Sussex County Council (the County Agreement) and subject to the terms and conditions set out in the Permission, this Deed and the

County Agreement the District Council is satisfied that this Deed is to be benefit of the public.

- 1.11 The parties hereto are satisfied that the provisions of this Deed comply with the requirements of Regulation 122 and Regulation 123 of the Community Infrastructure Levy Regulations 2010 as amended

2. **DEFINITIONS**

In this Deed it is hereby agreed between the Parties that the following expressions shall have the following meanings

Act means the Town and Country Planning Act 1990 and any amendment thereto

Affordable Housing means housing which, in accordance with the National Planning Policy Framework (dated March 2012) includes social rented, affordable rented and/or shared ownership/intermediate housing provided to households whose needs are not met by the market.

Affordable Housing should:

- meet the needs of households including availability at a cost low enough for them to afford, determined with regard to local incomes and local house prices.
- include provision for the home to remain at an affordable price for future households or, if these restrictions are lifted, for any subsidy to be recycled (subject to any statutory or contractual requirement for its repayment) for alternative affordable housing provision

Affordable Housing Land means the land on which the Affordable Housing Units are to be constructed

Affordable Housing Provider /AHP means a housing association within the meaning of the Housing Associations Act 1985; and/or a social landlord registered as such under the Housing Act 1996; and/or a registered provider within the meaning of the Housing and Regeneration Act 2008 and registered with the HCA; and/or an accredited partner of the HCA for the provision of Affordable Housing;

Affordable Housing Specification means the requirement that all Affordable Housing Units shall be designed and constructed in accordance with the HCA Design and Quality Standards (published April 2007) and Code 3, or such higher Code standard as may be needed to enable an AHP acquiring any of the Affordable Housing Units to comply with prevailing HCA requirements;

- that 20% of the Affordable Housing Units shall be constructed in accordance with the Sir Joseph Rowntree's (lifetime homes) standard; and
- that 2% of the Affordable Housing Units shall be constructed in accordance with the Wheelchair Standard

Affordable Housing Units means the Affordable Rented Units the Alternate Tenure Affordable Units and the Shared Ownership/Intermediate Units and **Affordable Housing Unit** shall be construed accordingly

Affordable Housing Unit Price means the price at which the Affordable Housing Units are to be offered for sale to an Affordable Housing Provider set out in Schedule 10 being 60% of their Open Market Value for the Affordable Rented Units and 75% of their Open Market Value for the Alternate Tenure Affordable Units and for the Shared Ownership/Intermediate Units

Affordable Rented Units means the Affordable Housing Units identified as such in Reserved Matters Submissions for each Phase or those Phase 1D Affordable Housing Units identified in the Phase 1D Application and which in accordance with the National Planning Policy Framework (dated March 2012) are to be let by registered providers of social housing to households who are in need of social rented or affordable rented housing: under a tenancy or letting agreement which is subject to rent controls that require a rent of no more than 80% of Market Rent

Alternate Tenure Affordable Units means the Affordable Housing Units identified as such in Reserved Matters Submissions for each Phase being 40% of the Affordable Housing Units in each Phase (rounded up or down to the nearest whole number) and in respect of which dwellings:

- (a) their Affordable Housing Unit Price shall be 75% of Open Market Value
- (b) their tenure shall be determined in accordance with Paragraphs 8.1.2, 8.7. and 8.8 of Schedule 4 or under the Fall Back Position under Paragraph 10 of Schedule 4 if applicable

Application means:

- (1) the planning application submitted to the District Council given the reference number DC/15/2813 / for variation of conditions 3, 4, 7, 8, 9 and 10 of hybrid planning application DC/10/1612 to enable the reconfiguration of the neighbourhood centre, community facilities and open space ("the Variation Application")
- (2) the planning application for Phase 1D submitted to the District Council given the reference number DC/15/2561 for the erection of 72 dwellings with associated access, parking and landscaping ("the Phase 1D Application")
- (3) the planning application submitted to the District Council given the reference number DC/16/0108 for engineering operations associated with landfill remediation and associated infrastructure including pumping station which replaces part B of the Hybrid Planning Application. ("the Engineering Application")

Code means the Code for Sustainable Homes dated 2003 published by the Department for Communities and Local Government

Commencement means the implementation of the Development by carrying out on the Site of any material operation pursuant to the Permission and for the purposes of this Deed the term "material operation" shall have the meaning set out in sub-sections 56(4) (a) (b) (c) and (d) inclusive of the Act PROVIDED THAT for the purpose of determining whether or not such a material operation has been carried out there shall be disregarded any works of:

- demolition
- site clearance and earthworks
- site inspection and preparation
- site surveys
- testing
- sampling
- soil investigations and assessment of contamination
- tree surgery/felling tree protection works and/or woodland management
- ecological surveys and mitigation
- archaeological investigation
- the erection of fencing or hoardings for site security and display of advertisements contractors compounds and other temporary accommodation site security haul roads wheel washing and parking areas
- diversion and laying of services service media trial holes pegging out

and "**Commenced**" shall be construed accordingly

Community Building means a multi-purpose building and related works to be constructed on the Community Building Site which unless otherwise agreed by the District Council shall comprise either

- (a) approximately 700 square metres NIA of flexible space which shall be designed for and capable of use for social community and leisure purposes
or

- (b) if agreed by the County Council and in the absolute discretion of the District Council may include an additional 150 square metres GIA or thereabouts for a Resources Centre -

which Community Building (for the avoidance of doubt and (subject to the prior approval in writing of the District Council) may form part of another building to be constructed in the Neighbourhood Centre in accordance with the Community Building Specification in such final location as shall have been approved under Reserved Matters Approvals

Community Building Site means the land shown for the purposes of identification only edged and shaded green on the Non Residential Uses Plan the precise boundaries of which are to be approved pursuant to the Reserved Matters Approvals

Community Building Specification means the specification for the Community Building to be approved pursuant to the Reserved Matters Approvals which shall:

- (a) if it includes the Resources Centre: be designed and built to a budget of One Million Pounds (£1,000,000) (excluding VAT) Index Linked (including such design legal and professional fees as shall have been previously approved by the District Council in writing and which sums for design legal and professional fees (including VAT) shall not exceed 10% of the budget of £1million pounds

PROVIDED ALWAYS THAT the District Council may require the Community Building to be designed and built to a higher specification provided it agrees to pay and pays any costs in excess of the budget and enters in to any necessary documentation to guarantee payment of such excess costs and provided that any sums for design construction and professional fees (including VAT) shall not exceed 10% of the final sum payable by the District Council exclusive of VAT

- (b) if it does not include Resources Centre: be designed and built to a budget of Eight Hundred and Twenty Three Thousand Pounds Five Hundred and Thirty Pounds (£823,530) (excluding VAT) Index Linked (including such design legal and professional fees as shall have been previously approved by the District Council in writing and which sums for design construction and professional fees (including VAT) shall not exceed 10% of the budget of £823,530

PROVIDED ALWAYS THAT the District Council may require the Community Building to be designed and built to a higher specification provided it agrees to pay and pays any costs in excess of the budget (and enters in to any necessary documentation to guarantee payment of such excess costs) and provided that any sums for design legal and professional fees (including VAT) shall not exceed 10% of the final sum payable by the District Council exclusive of VAT

Community Building Transfer means a transfer of the Community Building substantially in the form annexed in Schedule 8 Part 3 subject to any adaptations

required to meet the prevailing requirements of The Land Registry Rules for a transfer of part

Contribution(s) means the financial sums payable to the District Council pursuant to this Deed or the relevant one of them

County Council means the County Council of West Sussex

Deed means this deed of agreement

Development means the development of the Site pursuant to the Permission

Dwelling means an individual Open Market Unit and/or Affordable Housing Unit and/or Phase 1D Affordable Housing Unit constructed on the Site (but excluding any nursing homes / care homes)

Employment Land means the land shown for the purposes of identification only edged and shaded blue on the Non Residential Uses Plan or such other area of land as shall have been approved in writing for such purposes pursuant to the Reserved Matters Approvals

Employment Uses means uses within Use Class B1 (office development)

Fall Back Position means the circumstances described in Paragraph 10 of Schedule 4 under which Affordable Housing Units may notwithstanding any other provisions of this Deed be disposed of to either:

- an Affordable Housing Provider of the Owners' choice as Shared Ownership/Intermediate Units; and / or
- disposed of directly as Shared Ownership/Intermediate Units to individual purchasers tenants or occupiers under Paragraph 10.3(b) of Schedule 4

Fully Serviced means having the benefit of equivalent services and service media as the Open Market Units

Grant Funding means capital funding (including any subsidy) over and above that which the Affordable Housing Provider can provide from its own resources or bank or institutional funding or market borrowing for the purchase of the Affordable Housing Units - which additional capital funding is provided by the HCA and/or any other public body and which can for the avoidance of doubt include recycled grant and/or other forms of public subsidy

GIA or Gross Internal Area means the gross internal area of a building as measured in accordance with the RICS code of measuring practice

HCA means the Homes and Communities Agency or any predecessor or successor body to it

Help to Buy Agent means a body appointed or approved by the HCA to act as agents for the allocation of intermediate housing including Shared Ownership/ Intermediate Units

Hybrid Planning Application means the hybrid planning application submitted to the District Council for the development of the Site given the District Council's reference number DC/10/1612 comprising the following:

Part A: Outline approval for the development of approximately 2500 dwellings, new access from A264 and a secondary access from A264, neighbourhood centre, comprising retail, community building with library facility, public house, primary care centre and care home, main pumping station, land for primary school and nursery, land for employment uses, new rail station, energy centre and associated amenity space.

Part B: Full planning permission for engineering operations associated with landfill remediation and associated infrastructure including pumping station

Part C: Full permission for the development of Phase 1 of 291 dwellings, internal roads, garages, driveways, 672 parking spaces, pathways, sub-station, flood attenuation ponds and associated amenity space

Part D: Full permission for the construction of a 3 to 6 metre high (above ground level) noise attenuation landform for approximately 700 metres, associated landscaping, pedestrian/cycleway and service provision (land known as Kilnwood Vale).

Index means the All in Tender Price Index published by the Building Costs Information Service of the Royal Institution of Chartered Surveyors at the time the Contributions are due to be paid under the terms of this Deed

Index Linked means such additional figure as is calculated in accordance with Clause 4.20 hereof

Link Road means the road connecting the A264 to the Neighbourhood Centre as shown on the plan at Schedule 15 to this Deed

Local Connection means in relation to an individual such individual who:

- immediately before taking up occupation of an Affordable Housing Unit or a Phase 1D Affordable Housing Unit had his only or principal home in the administrative area of the District Council for a continuous period of not less than two years
- a member of his household has a parent adult child brother or sister whose only or principal home is and has been for a continuous period of not less than two years in the district of Horsham and he wishes to be near that relative OR

- is and has been permanently employed in the district of Horsham for a continuous period of not less than three years

OR such other person as may be approved by the Council and is registered on the Council's housing waiting list.

Marketing Period means the following periods:

- in respect of the Employment Land a period commencing on occupation of the 509th Dwelling and ending on the later of occupation of the 1,009th Dwelling or the fifth anniversary of the occupation of the 509th Dwelling whichever is the later
- in respect of the Retail Facilities Land a 30 month period commencing on the Occupation of the 50th Dwelling

Market Rent means an opinion of the best rental achievable for the letting of an Affordable Housing Unit on the date of valuation assuming the following:

a willing tenant and a willing landlord in an arm's-length transaction

- that prior to the date of the valuation there had been a reasonable period (having regard to the nature of the property and the state of the market) for the proper marketing of the interest, the agreement of the price and the terms for the completion of the letting
- that the state of the market level of values and other circumstances were on any earlier assumed date of exchange of contracts the same as on the date of valuation
- that no account is taken of an additional bid by a prospective tenant with a special interest
- that any restrictions or obligations imposed upon the property by reason of this Deed are disregarded
- that there are no restrictions (whether imposed by this Deed or any lease) as to the persons who may occupy the property or to whom a lease of the property may be granted or assigned and that both parties to the transaction had acted knowledgeably prudently and without compulsion
- there are no sales incentives and the property is Fully Serviced and ready for Occupation

Marketing Strategy means a bona fide marketing campaign as set out in Schedule 9 (or as shall have been otherwise approved in writing by the District Council) for the duration of the relevant Marketing Period to be carried out by a reputable commercial agent (or agents) approved in writing by the District Council operating in the locality involving the marketing and advertising of the Employment Land and the Retail

Facilities Land and the Primary Care Centre Site for disposal by way of sale or lease on reasonable commercial terms

Neighbourhood Centre means the neighbourhood centre to be located on the Site on the land shown for the purposes of identification only outlined by a red dashed line on the Non Residential Uses Plan in accordance with the Neighbourhood Centre Brief

Neighbourhood Centre Brief means a brief setting out the detailed design and land use principles for the Neighbourhood Centre approved by the District Council pursuant to the Reserved Matters Approvals

Net Sales Area means that part of the Gross Internal Area of any of the Retail Facilities used for the display of goods for purchase by customers (including counters, gondolas and other display units) but excluding the space lying between the checkouts and the internal face of the nearest outer wall of the Retail Facility;

- the checkout areas;
- any concourse/lobby area;
- toilet areas; and
- warehouse, storage, offices and administration area, customer service areas, rest rooms, staff rooms, and food preparation areas
- electronic points of sale (and self check out areas)

NIA means the net internal area of a building as measured in accordance with the RICS Code of Measuring Practice

Nominations Agreement (Affordable Rented) means a nominations agreement (affordable rented units) substantially in the form set out in set out in Schedule 12 but subject to such reasonable amendments as may be requested by the Owners and/or the AHP and agreed in writing by the District Council

Nominations List means the list that may be supplied by the District Council or the Help to Buy Agent giving the names of persons whom the District Council or Help to Buy Agents wish to nominate as purchasers or tenants of the Affordable Housing Units or the Phase 1D Affordable Housing Units

Nominee means any person on the Nominations List or otherwise nominated by the District Council or the Help to Buy Agent

Nominee means for the purposes of Parts 2 and 3 of Schedule 2 to this Agreement a local authority including a parish council

Non Residential Uses Plan means the Plan numbered 2 annexed hereto marked "Non Residential Uses Plan"

Notice of Construction means a notice in the form set out in Schedule 1 Part 1 served by the Owners on the District Council in respect of any Phase including Phase 1D confirming the completion of the second brick course above damp proof course of the first Dwelling to be constructed in each Phase including Phase 1D

Notification Notice means a notice in the form set out in Schedule 1 Part 2 served by the Owners on the District Council on Occupation of the first Dwelling on the Site and upon each anniversary of the date of Occupation of the first Dwelling until the Development is completed

Occupation means the first residential occupation of a Dwelling save for the purpose of fitting out or marketing and the expressions "**Occupy**" and "**Occupied**" shall be construed accordingly

Open Market Units means the Dwellings constructed on the Site which are not Affordable Housing Units or Phase 1D Affordable Housing Units and '**Open Market Unit**' shall be construed accordingly

Open Market Value means an opinion of the best price at which the sale of an interest in the property would have been completed unconditionally for cash consideration on the date of valuation assuming:

- a willing buyer and a willing seller
- that prior to the date of the valuation there had been a reasonable period (having regard to the nature of the property and the state of the market) for the proper marketing of the interest, the agreement of the price and the terms for the completion of the sale
- that the state of the market level of values and other circumstance were on any earlier assumed date of exchange of contracts the same as on the date of valuation
- that no account is taken of an additional bid by a prospective purchaser with a special interest
- that any restrictions or obligations imposed upon the property by reason of this Deed are disregarded
- that there are no restrictions (whether imposed by this Deed or any lease) as to the persons who may occupy the property or to whom a lease of the property may be granted or assigned and that both parties to the transaction had acted knowledgeably prudently and without compulsion
- there are no sales incentives and that the property is completed Fully Serviced and ready for Occupation

Open Spaces means each of the following areas identified in 1 - 14 below as shown for the purposes of identification only on the Open Spaces Strategy and Phasing Plan and described within Part 1 of Schedule 2 but which shall be more particularly identified delineated and particularised in the Open Spaces Specification

1. Kilnwood Vale Park and Pavilion
2. Leisure Park
3. The Knoll Neighbourhood Park
4. The Viewpoint Neighbourhood Park
5. Kilnwood Green
6. Community Greens
7. West Greenway
8. Central Greenway
9. East Greenway
10. Bewbush Brook
11. Green Corridors North of Railway 1
12. Green Corridors North of Railway 2
13. Capon Grove
14. Pondtail Shaw

together with any other areas of useable open space which are intended for use by the public and which are identified as such by the Owners on plans submitted and approved under the Open Spaces Specification or the terms of the Permission

Open Spaces Completion Certificate means the notice served by the District Council upon the Owners signifying that the Open Spaces and/or SUDS or part thereof is/are acceptable for transfer

Open Spaces Notice means the notice served by the Owners upon the District Council signifying that in their opinion the Open Spaces and/or SUDS or parts thereof are ready for transfer

Open Space Phasing Plan means the phasing plan providing for the delivery of the Open Spaces and SUDS in each Phase and which plan is to be submitted to and approved in connection with the Open Spaces pursuant to the Reserved Matters Approvals or the terms of the Permission

Open Spaces Provisional Certificate means the notice served by the District Council upon the Owners signifying that the Open Spaces and/or SUDS or part thereof is /are not ready for transfer and identifying outstanding works to be completed

Open Spaces Specification means the specification or specifications detailing the design layout management maintenance facilities and equipment to be provided in connection with each of the Open Spaces approved as part of the Reserved Matters Approvals or the terms of the Permission

Open Spaces Strategy and Phasing Plan means the Plan numbered 3 annexed hereto marked Open Spaces Strategy and Phasing Plan

Open Spaces Transfer means a transfer substantially in the form of the transfer marked Open Space Transfer annexed in Schedule 8 Part 1 subject to any adaptations required to meet the prevailing requirements of The Land Registry Rules for a transfer of part

Owners means the First Owner the Second Owner and the Third Owner and shall include their respective successors in title heirs and assigns and reference to the expression "Owner" shall mean the relevant one of them

Ownership Plan means the Plan numbered 1 annexed hereto marked Ownership Plan

Part-Phase means any part of a whole Phase which has been approved in writing by the District Council pursuant to a Reserved Matters Submission

Pavilion means a single storey sports pavilion and related car parking to be provided on the Site in accordance with the Pavilion Specification within or adjacent to the sports pitches on the land shown for the purposes of identification only by the notation "pavilion" on the Open Spaces Strategy and Phasing Plan

Pavilion Specification means the specification which shall include a detailed technical specification approved by the District Council pursuant to the Reserved Matters Approvals for the location and construction of the Pavilion (which shall be designed and built to a budget of £300,000) exclusive of VAT (including such design construction and professional fees as shall have been previously approved by the District Council in writing and which sums for design and professional fees shall not exceed 10% of the budget including VAT)

PROVIDED ALWAYS that the District Council may require the Pavilion to be built to a higher specification provided it agrees to pay for and pays any costs over and above the £300,000 budget (and enters in to any necessary documentation to guarantee payment of such excess costs) and provided that any sums for design legal and professional fees (including VAT) shall not exceed 10% of the final sum payable by the District Council exclusive of VAT

Payment Notice means the duly completed payment notice in the form of Schedule 14

Permission means the planning permissions granted by the District Council pursuant to the Application

Phase means (unless where otherwise stated) any of Phase 1D Phase 2 Phase 3 Phase 4 or Phase 5 or the Reserve Land as identified on the Phasing Plan unless otherwise agreed in writing with the Council

Phase 1D means the land edged and shaded grey on the Phasing Plan

Phase 2 means the land edged and shaded orange on the Phasing Plan

Phase 3 means the land edged and shaded red on the Phasing Plan

Phase 4 means the land edged and shaded green on the Phasing Plan

Phase 5 means the land edged and shaded blue on the Phasing Plan

Phasing Plan means the plan numbered 4 annexed hereto marked Phasing Plan

Phase 1D Affordable Housing Land means the land on which the Phase 1D Affordable Housing Units are to be constructed as shown on the "Phase 1D Affordable Housing Plan"

Phase 1D Affordable Housing Plan means the plan at Schedule 13

Phase 1D Affordable Housing Units means the 16 Affordable Rented Units (8 one bed flats and 8 two bed flats) and the 10 Shared Ownership Units (2 bed flats) to be provided on the Phase 1D Affordable Housing Land in accordance with the Affordable Housing Specification and the Phase 1 Affordable Housing Plan and **Phase 1D Affordable Housing Unit** shall be construed accordingly.

Plans means the Plans annexed to this Deed

Primary Care Centre means a multi-purpose building (which may for the avoidance of doubt form part of another building) within or adjacent to the Neighbourhood Centre and which subject to any alternative requirements of the primary care trust or the practice intending to occupy shall unless otherwise agreed by the District Council be designed to accommodate a four doctor surgery of approximately 700 m² NIA plus additional space (if required) for dental services voluntary and social services and a pharmacy - the exact size design and configuration of which building shall be determined by Reserved Matters Submissions in the light of the requirements of any operator or funding body and the needs of the Development's population at the time of submission and shall be in accordance with such details as may be approved pursuant to Reserved Matters Approvals

Primary Care Site the land identified as such and shown for the purposes of identification only edged and shaded orange on the Non Residential Uses Plan or as otherwise approved pursuant to a Reserved Matters Submission

Public Art means one piece of public art to be provided on each Phase of the Site in accordance with the Public Art Specification at a cost of twenty thousand pounds for each Phase which sum shall not include the costs of consultation and commissioning of the Public Art or the preparation of and submission of the Public Art Specification

Public Art Specification means the specification for the design commissioning location nature installation and future maintenance of the Public Art approved as part of the Reserved Matters Approvals or the terms of the Permission and shall include but not be limited to

- the location of the Public Art within each Phase
- the design of the Public Art
- details of the consultation and involvement of the local community groups and individuals and other parties (including the District Council) in the development and design of the Public Art to be provided

Railway Station means any railway halt together with platforms and ticketing facilities constructed on the Railway Station and Station Car Park Site

Railway Station and Car Park Site means the land shown for the purposes of identification edged and shaded pink on the Non Residential Uses Plan which is to be reserved and set aside for a Railway Station and Station Car Park in accordance with Schedule 6 the details and specific location and boundaries of which Railway Station and Station Car Park shall be approved pursuant to the Reserved Matters Approvals

Remediation Works means all of the works in respect of Phases 1D 2 and 3 (including specialist foundations) identified in rows (2) earth movement and land fill remediation and row (3) foundation improvements and Gas Protection measures of Table 5 of the Turner Morum Assessment dated the 9th September 2010 set out in Schedule 11

Reserved Matters Approvals means the approval of any matter reserved for subsequent approval by the District Council pursuant to the Permission

Reserved Matters Submission(s) means submission for the approval of the District Council of any matter reserved for subsequent approval pursuant to the Permission

Reserve Land means the land shown for the purposes of identification only edged and shaded purple on the Phasing Plan

Resources Centre means a building which unless otherwise agreed by the District Council shall contain approximately 150 square metres GIA floor space (and which

shall be designed for and capable of use for library social community and/or leisure purposes including internet based resource facilities and which Resources Centre may (for the avoidance of doubt) subject to the written approval of the District Council in their absolute discretion form part of the Community Building

Retail Facilities means retail buildings within Use Classes A1 A2 A3 A4 and/or A5 with a combined Net Sales Area of between 1,250 square metres and 2,500 square metres including small – scale and independent retailers plus related car parking and servicing areas on the Retail Facilities Land as approved pursuant to the Reserved Matters Approvals and the expression "Retail Facility" shall be construed accordingly

Retail Facilities Land means land within the Neighbourhood Centre shown for the purposes of identification only edged and shaded purple on the Non Residential Uses Plan or as otherwise approved under Reserved Matters Approvals which is capable of accommodating the Retail Facilities

Site means the land edged red on the Ownership Plan

Shared Ownership/Intermediate Unit means an Affordable Housing Unit (i) in respect of which a long lease is granted at a premium representing a percentage of the Open Market Value of that Dwelling and subject to a rent payable in respect of the remaining percentage and whether or not the lessee has the right to pay a further premium in respect of a future percentage of the purchase price and/or to acquire a further leasehold or freehold reversion to the lease and is provided (having regard to local incomes and local house prices in the administrative district of the District Council) on terms whereby the rental elements for any unacquired equity shall be below Market Rent; or (ii) is to be reserved for disposal by way of any other forms of Intermediate tenure of any of the types and descriptions identified in section 70(5) of the Housing and Regeneration Act 2008 or contained in Annex B of the National Planning Policy Framework (NPPF March 2012) or any amendment thereto and any subsequent advice and guidance published by H.M. Government in its stead

Standard Terms means terms relating to the sale or (in the case of a mixed use building or block of flats or where Affordable Housing Units and Open Market Units are to be found in the same building) a long leasehold disposal of the Affordable Housing Units in each Phase or Part Phase at the Affordable Housing Unit Price providing for:

- The disposal of the Affordable Housing Land on which the Affordable Housing Units in the relevant Phase are to be constructed as at completion of the second brick course above damp proof course (or such other stage of construction as agreed with the purchaser deemed to constitute the stage of construction commonly known as "golden brick") for an apportioned part of the Affordable Housing Unit Price together with

- A contract for the construction of the Affordable Housing Units in each Phase whereby the vendor agrees to procure the construction of Affordable Housing Units to a specification for such Affordable Housing Units that meets the requirements of Schedule 4 and with monthly stage payments of the balance of the Affordable Housing Unit Price or such other phased payment terms for the payment of the Affordable Housing Unit Price as may be agreed in their absolute discretions between the vendor and the Affordable Housing Provider for the balance of the Affordable Housing Price

Station Car Park means a car park designed to serve the Railway Station to be constructed on the Railway Station and Car Park Site the details and specific location and boundaries of which Railway Station and Station Car Park shall be approved pursuant to the Reserved Matters Approvals

SUDS: means a sequence of management practices or part of a sequence of management practices shown for identification only on the Open Space Strategy Provision Plan (excluding underground infrastructure) designed to drain surface water in a sustainable way in accordance with the SUDS Specification

SUDS Approving Body means any body appointed pursuant to the Flood and Water Management Act 2010 or the Water Act 2003 with responsibility for approving the design and construction of SUDS features and subsequently for owning and maintaining them

SUDS Specification means the specification or specifications detailing the location number design layout construction management maintenance and delivery date in connection with each of the SUDS to be submitted to the District Council and approved pursuant to the Reserved Matters Approvals (except in the case of Phase 1D of the Development where such detailed approval shall have been granted pursuant to the Permission)

SUDS Transfer means a transfer substantially in the form of the transfer marked SUDS Transfer annexed in Schedule 8 Part 2 subject to any adaptations required to meet the prevailing requirements of The Land Registry Rules for a transfer of part







Tariff means the Index Linked sum of Eight Pounds Ninety Pence (£8.90) per square metre of Open Space or SUDS being the sum payable to the District Council upon transfer of any area of Open Space or SUDS to the District Council

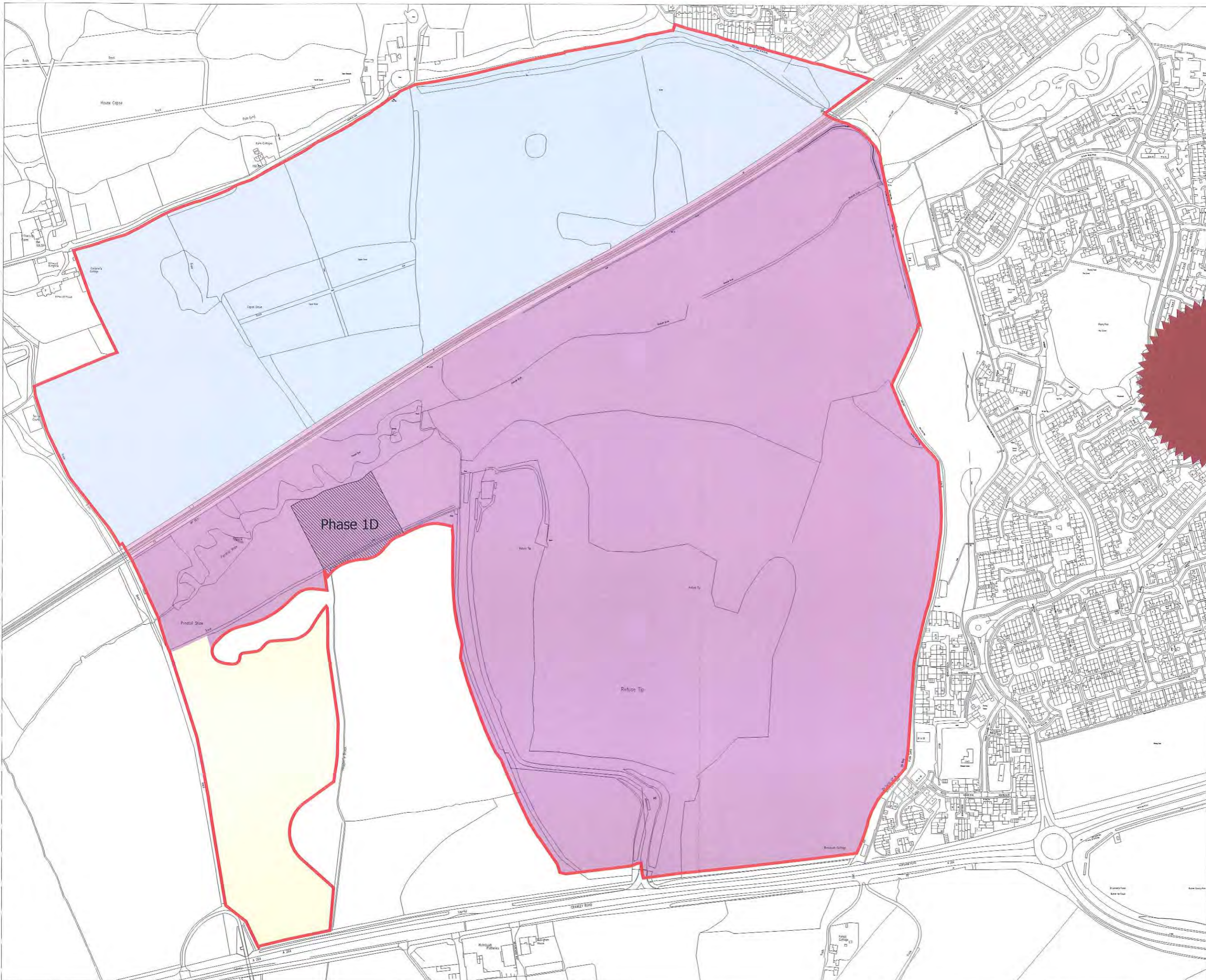
Use Class means any specified use class or subclass contained in the Town and Country (Use Classes) Order 1987 as amended

VAT means the tax referred to in the Value Added Tax Act 1994 or any Tax of a similar nature which is introduced in substitution for or as an addition to such tax from time to time

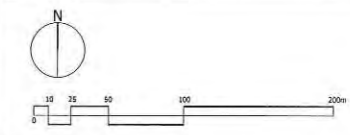
Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  Land Registry Title Number: WSX332098
-  Land Registry Title Number: WSX353549
-  Land Registry Title Number: WSX287388
-  Railway - Unregistered
-  Phase 1D - Land Registry Title Number: WSX353549



awl



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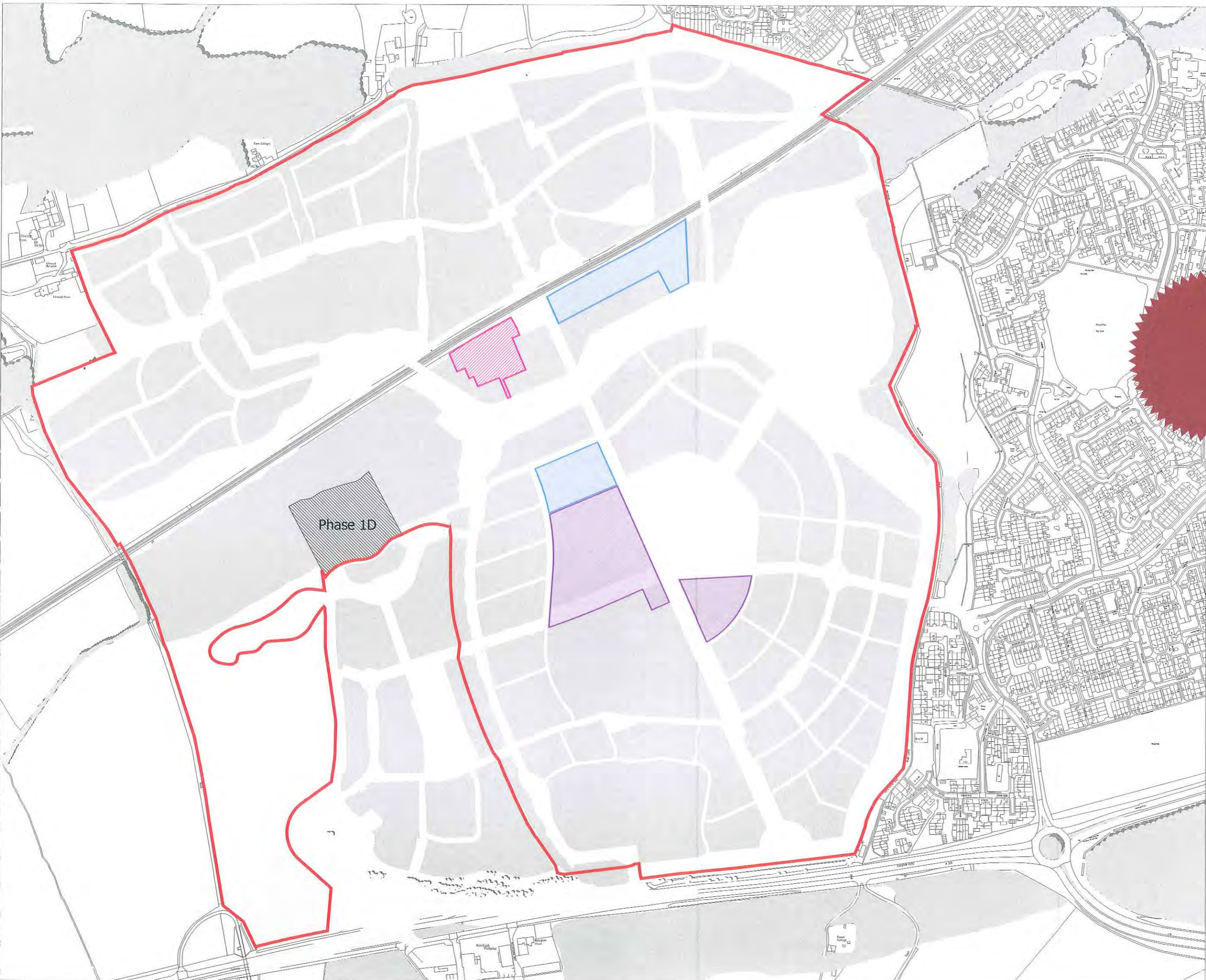
Client
Crest Strategic
 Project
**Kilnwood Vale
 Bewbush, Crawley**
 Description
**Kilnwood Vale S106 Agreement
 Ownership Plan**

Status		
Scale	Drawn By	Date
1:2500@A1 NT		Mar 2016
Job Number	Drawing Number	Revision
30885	401	

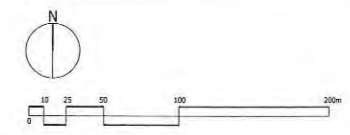
Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  Neighbourhood Centre
-  Employment
-  Station / Station Car Par
-  Phase 1D



ALSOOS
 [Signature]



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 E: Wey@BroadwayMalyan.com
 www.BroadwayMalyan.com

Client
Crest Strategic
 Project
**Kilnwood Vale
 Bewbush, Crawley**
 Description
**S106 Agreement -
 Non Residential Uses Plan**

Status	Draft	
Scale	Drawn By	Date
1:2500@A1	NT	Mar 2016
Job Number	Drawing Number	Revision
30885	402	



- GENERAL**
- Site Boundary
 - Extent of Key Areas
- FORMAL PROVISION**
- Sports Provision
 - Play
- INFORMAL PROVISION**
- Allotment / Growing Space
 - General Amenity
 - Woodland and Hedgerows
 - Water Attenuation Ponds
- PHASING BOUNDARIES**
- Phase 2
 - Phase 3
 - Phase 4
 - Phase 5
 - Reserve Land
 - Phase 1D

Rev	Date	Description
G	08/04/2016	Graphic clarifications.
F	06/04/2016	Arrow leader added from annotation.
E	26/02/2016	Revised in line with MMA DAS Open Spaces plan. All information updated accordingly.
D	28/07/2011	Visual presentation amendments.

Drawing Status: **PLANNING**

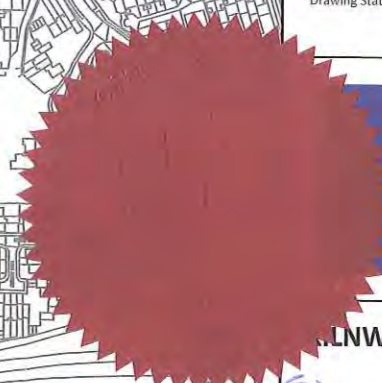


KILNWOOD VALE

Drawing Title:
OPEN SPACES STRATEGY AND PHASING PLAN

Scale: 1:5000	Sheet Size: A3	Date: NOV 2010
Drawing No.: 0404.00027.16.GA.210	Revision: G	








TO BE READ IN CONJUNCTION WITH s106 SCHEDULE 2

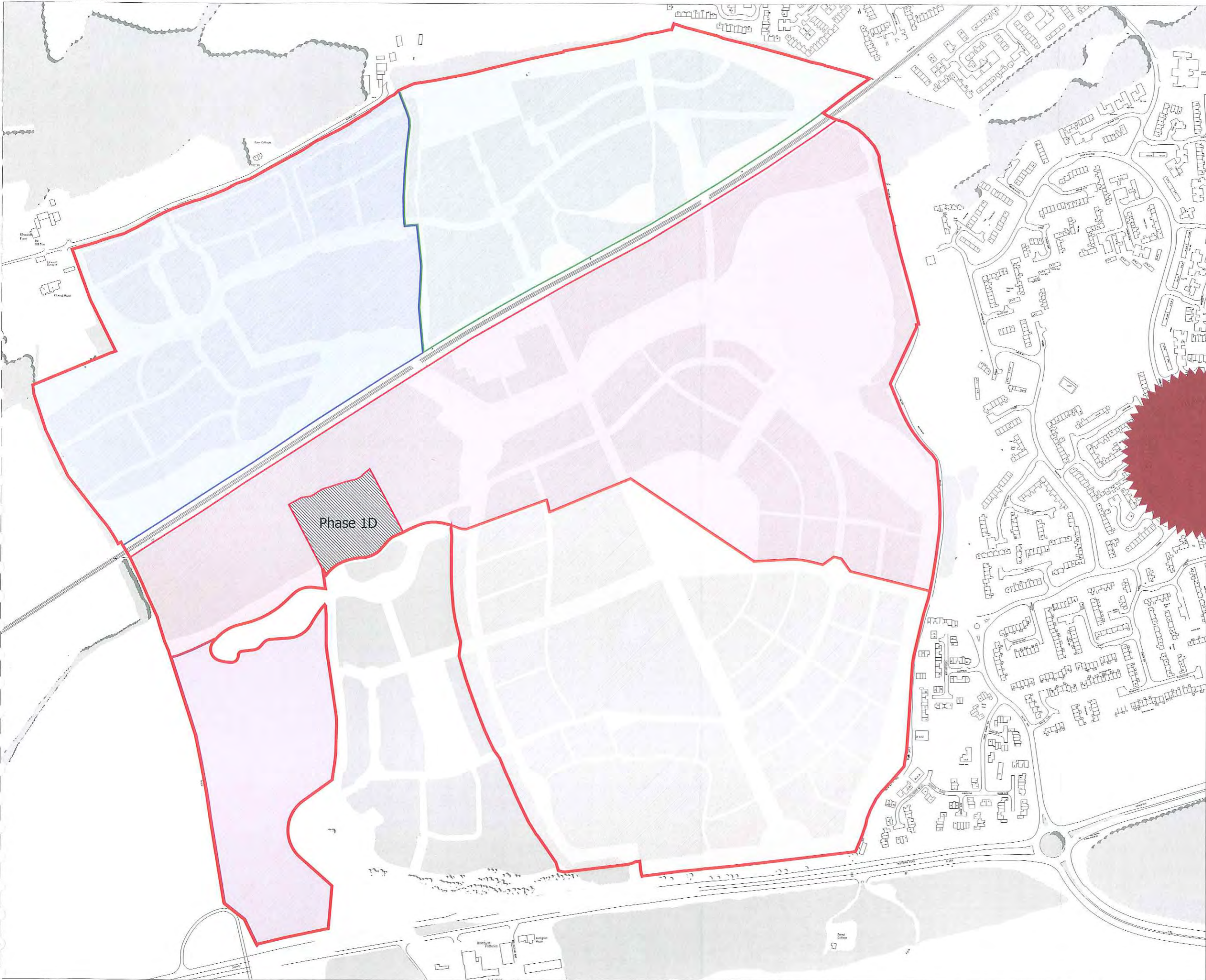


PLAN 4

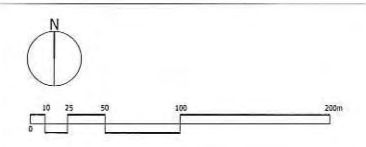
Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  Phase 2
-  Phase 3
-  Phase 4
-  Phase 5
-  Reserve Land
-  Phase 1D



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Client
Crest Strategic

Project
**Kilnwood Vale
Bewbush, Crawley**

Description
**S106 Agreement -
Phasing Plan**

Status

Scale	Drawn By	Date
1:2500 @ A1	NT	Mar 2016
Job Number	Drawing Number	Revision
30885	403	

Water and Sewerage Company means the body responsible for the maintenance and adoption of public surface water sewers in the locality

Wheelchair Standard means designed so that wheelchair users can access all areas of Wheelchair Units

Wheelchair Units means Affordable Housing Units constructed to Wheelchair Standard

Working Days means any day(s) upon which clearing banks in the City of London are open to the public and for the avoidance of doubt such date shall not include any Saturday or Sunday New Year's Day Good Friday Easter Monday May Day Christmas Day Boxing Day or any other bank holiday whether statutory or otherwise

3. **STATUTORY PROVISIONS AND COVENANTS**

3.1 This Deed is made pursuant to the provisions of Section 106 of the Act Section 1 of the Localism Act 2011 Section 111 of the Local Government Act 1972 as amended and all other statutory and enabling powers and has been entered into by the District Council pursuant to its Development Management Committee North 15th March 2016 minute no DCN 115 and 116 and shall be enforceable accordingly but without prejudice to all and any other means of enforcing it at law or in equity or by statute and is intended to regulate the use and development of the Site with the intent that the obligations herein shall be planning obligations enforceable by the District Council with the intention that such planning obligations shall bind and run with the Site

3.2 The Parties hereby agree that the obligations created by this Deed are planning obligations for the purposes of Section 106 of the Act and are enforceable by the District Council and that the Site shall be subject in all respects to the covenants undertakings and obligations contained in this Deed

3.3 This Deed constitutes a deed

4. **INTERPRETATION**

4.1 In this Deed the singular includes the plural and vice versa unless the context otherwise requires words denoting the singular shall include the plural and vice versa and words denoting any one gender shall include all genders and words denoting persons shall include bodies companies unincorporated associations and partnerships

4.2 Any reference to the First Owner the Second Owner and the Third Owner "the Owners" or any other legal or natural person shall unless the context indicates otherwise include his her its or their heirs assigns and successors in title and in the case of any local authority shall also include any successor in function. Any covenants obligations or other commitments given by more than one party shall be joint and several and where any party consists of two or more persons obligations expressed to be made by or with that party are deemed to be made by or with such persons jointly and severally.

- 4.3 References to Clauses Sub-Clauses and Schedules Paragraphs Plans and Sub-Paragraphs are references to clauses sub-clauses and schedules paragraphs plans and sub-paragraphs to this Deed unless the context otherwise requires
- 4.4 The schedules contained in this Deed shall be deemed to be incorporated herein and to have the same force and effect as if the provisions thereof were set out in the body of this Deed
- 4.5 Any paragraph headings in the body or in any schedule to this Deed are for ease of reference only and are not to be taken into account in the construction of this Deed
- 4.6 The District Council is for the purposes of the Act the local planning authority for the administrative district in which the Site is situated and by whom the obligations restrictions stipulations conditions and covenants contained in this Deed are enforceable
- 4.7 No person shall be liable in respect of any covenant restriction or obligation (or any breach thereof save in respect of any antecedent breach) once they shall have parted with their interest in that part of the Site to which the relevant covenants restrictions or obligations relate provided they shall have notified the District Council in writing of the name and registered office (if applicable) or address of the new owner and the date and extent of the land transferred and the transfer has been registered at the Land Registry
- 4.8 Save in respect of the restrictions on the occupation of the Affordable Housing Units and the Phase 1D Affordable Housing Units in Schedule 4 the obligations restrictions and covenants contained in this Deed shall not be enforceable by or against any purchaser tenant or occupier or mortgagee of any individual Dwelling or chargee or receiver of any such persons or persons deriving title through or under any such persons or their successors in title and assigns or their mortgagees nor shall the consent seal or signature of any such persons or their mortgagees be required to amend adjust or supplement this Deed
- 4.9 Nothing herein contained or implied shall prejudice or affect the rights discretions powers duties and/or obligations of the District Council under all or any statutes bye laws statutory instruments orders and/or regulations in the exercise of their functions as a local authority.
- 4.10 The parties to this Deed do not intend that any of its terms will be enforceable by virtue of the Contract (Rights of Third Parties) Act 1999 by any person not a party to it
- 4.11 The validity construction and performance of this Deed shall be governed by English Law and each party agrees to submit to the exclusive jurisdiction of the English Courts as regards any claim or matter arising under this Deed
- 4.12 Reference to any statute or statutory provisions includes a reference to:-

- 4.12.1 that statute or statutory provision as from time to time amended extended re-enacted consolidated or replaced; and
- 4.12.2 all statutory instruments or orders made pursuant to it whether before or after the date of this Deed.
- 4.13 In the event that any of the Contribution(s) or any instalment of such Contribution(s) is not paid by the date on which the relevant payment is due under this Deed the Owners shall pay to the District Council interest on the contribution at the rate of four per centum per annum above the base lending rate for the time being in force of the Bank of England which shall be calculated on a day to day basis as the District Council may specify
- 4.14 **Costs**
- The Owners hereby agree to pay to the District Council prior to completion of this Deed:
- 4.14.1 the legal costs of the District Council
- 4.14.2 the monitoring cost of One Thousand Five Hundred Pounds per Phase and/or part Phase and/or Phase 1D of the Development
- 4.14.3 the planning officer costs of One Thousand Pounds per Phase and/or part Phase and/or Phase 1D of the Development
- 4.15 The Owners hereby covenant and agree to attach a duly completed Payment Notice to the payment of each Contribution or part thereof made in pursuance of their obligations under this Deed and to send the same together with the payment due to the Head of Legal and Democratic Services at the District Council' s Office.
- 4.16 The Owners hereby give consent for the Plans to be reproduced by the District Council and shall indemnify the District Council against all actions costs claims and demands which may be made against the District Council or its employees servants or agents in connection with the copyright of the same.
- 4.17 The Owners hereby warrant to the District Council that no registerable interest exists which is not so registered at the Land Registry in respect of the Site at the date of this Deed.
- 4.18 It is hereby agreed between the parties hereto that failure by the District Council at any time to enforce the provisions of this Deed or to require performance strictly or otherwise by the Owners of any of the conditions covenants agreements or obligations of this Deed or any failure or delay by the District Council to exercise any right or remedy shall not be construed as a waiver of or creating an estoppel in connection with such condition covenant or agreement or obligation and shall not affect the validity of this Deed or any part thereof or the right of the District Council to enforce

any provision and any variation shall not vitiate the remainder of the Deed which shall remain in full force and effect subject to such amendment or amendments.

4.19 All payments in accordance with the terms of this Deed shall be exclusive of any VAT payable in respect thereof

4.20 **Indexation**

The Contributions, Tariffs budgets for the Community Building and the Pavilion and estimates for Public Art shall be adjusted by the percentage change (if any) in the Index between its value as at the date of its last publication prior to the Base Date and its value as at the date of its last publication (here including any forecast index which may have been published in advance of any final index) immediately prior to the date the relevant Contribution or Tariff is paid budget is estimated or Public Art is commissioned in accordance with the following table:

Column 1	Column 2
CONTRIBUTION	INDEX AND BASE DATE/BASE VALUE
1. the Tariff	BCIS / Base Date means 17 th October 2011
2. the budget for the Community Building	BCIS / Base Date means 17 th October 2011the
3. the budget for the Pavilion	BCIS / Base Date means 17 th October 2011the
4. Public Art (one piece per Phase each to a value of £20,000)	BCIS / Base Date means 17 th October 2011the

5. **REGISTRATION OF THIS DEED**

This Deed shall be registered as a local land charge in the Register of Local Land Charges and the Owners hereby consents in relation to their respective Land Registry Titles to the District Council making an application to the Land Registry as regards an entry in the Charges Register of the registered title numbers referred to in Recitals 1.1 1.3 and 1.4 of this Deed of a notice of this Deed pursuant to the provisions of the Land Registration Act 2002.

6. **CONDITIONALITY**

This Deed shall come into effect on the date hereof but the provisions in Schedule 1 to Schedule 14 shall only take effect upon:

- 6.1.1 the Permission having been granted and issued by the District Council and
- 6.1.2 the Development having been Commenced and
- 6.1.3 a period of 6 weeks having elapsed without any person having applied for leave to apply for judicial review of the Permission and/or this Deed or any decision or resolution of the District Council in relation to this Deed or the Permission unless the Development shall have been Commenced prior to expiry of the said 6 week period

7. NOTICES

- 7.1 any notice consent or approval required to be given under this Deed shall be in writing and shall be delivered personally or sent by pre-paid recorded delivery post
- 7.2 the address for service of any such notice consent or approval as aforesaid shall in the case of service upon the District Council be at the address aforesaid to be marked for the attention of the Head of Legal and Democratic Services or such other addresses for service as shall have been previously notified by the District Council to the Owners and in the case of service upon the Owners shall be at their registered office addressed to the Company Secretary or at their addresses aforesaid or such other addresses for service as shall have been previously notified by the Owners to the District Council respectively
- 7.3 a notice consent or approval under this Deed shall be deemed to have been served as follows:
 - 7.3.1 if personally delivered at the time of delivery;
 - 7.3.2 if posted recorded delivery at the expiration of 48 hours after the envelope containing the same was delivered into the custody of the postal authority within the United Kingdom;

and in proving such service it shall be sufficient to prove that personal delivery was made or that the envelope containing such notice consent or approval was properly addressed and delivered into the custody of the postal authority in a prepaid first class recorded delivery envelope (as appropriate)

8. OWNERS' COVENANTS

The Owners for themselves their assigns heirs and their successors in title to their respective parts of the Site and each and every part of them and with the intention of binding their respective parts of the Site and each and every part of them and into whosoever hands the same may come hereby severally covenant with the District Council to comply with the obligations undertakings and covenants set out in this Deed and the Schedules hereto

9. **DISPUTES**

- 9.1 In the event that the District Council does not agree the Market Rent or Open Market Value of any of the Affordable Housing Units for the purposes of the bidding procedures in paragraph 8 of Schedule 4 or there is any dispute as to the reasonableness of any alternative marketing measures under paragraph 7 of Schedule 9 the matter in dispute may be referred by the Owners or the District Council for determination by an independent chartered valuer or surveyor appointed by the Owners and the District Council whose identity shall be agreed between them or in the absence of agreement appointed at the request of the Owner and/or the District Council by the President of the Royal Institution of Chartered Surveyors and who shall have at least ten years post-qualification experience and be suitably qualified in housing valuations or construction and engineering costings as appropriate costs
- 9.2 In the event that the District Council does not agree the costings for the purposes of Paragraph 16 of Schedule 4 the matter in dispute may be referred by the Owners or the District Council for determination by an independent quantity surveyor or chartered engineer or surveyor appointed by the District Council whose identity shall be agreed between the parties to the dispute or in the absence of agreement appointed at the request of the District Council by the President of the Royal Institution of Chartered Surveyors and who shall have at least ten years post-qualification experience and be suitably qualified in the calculation and appraisal of construction and engineering costings
- 9.3 The independent chartered valuer quantity surveyor or engineer shall otherwise follow the following procedures which shall form part of his terms of appointment:
- 9.3.1 Upon his appointment he shall serve written notice on the both parties
 - 9.3.2 He shall act as an expert and not an arbitrator
 - 9.3.3 He shall invite written representations on behalf of the person making the reference to him inviting such representations within 21 days of his appointment
 - 9.3.4 He shall give the other party to the dispute him a further 21 days to respond to the any representations duly made under Clause 9.3.3
 - 9.3.5 He shall then give the parties 14 days to make final submissions to him in writing
 - 9.3.6 He shall have unfettered discretion to determine the reference to him and shall give reasons for his decision
 - 9.3.7 His determination including any decision as to the payment of his own costs and those of the parties shall be final and binding on the District Council and the person making reference to him and on any other

parties and shall be made within 21 days of the receipt of the representations in Sub-Clause 9.3.4 above or the expiry of the 14 day period under Sub-Clause 9.3.4 without any such representations being received.

9.3.8 His fees and expenses shall be paid initially by the person making the reference to him but he may in making his determination require such payments on account of his fees to be reimbursed in whole or in part by the other party should he determine that the other party should be responsible for his fees.

10. **MISCELLANEOUS**

The parties hereby agree that:

10.1 this Deed supersedes and replaces all previous negotiations whether oral or written and

10.2 no party has relied on any express or implied statement warranty representation or undertaking given by or on behalf of any other and no collateral agreement exists between the parties and

10.3 nothing herein contained excludes the liability of any of the parties in relation to fraud

11. **SDLT**

The District Council does not consider that entry into this Deed is intended to constitute a transaction for a chargeable consideration for which Stamp Duty Land Tax is required and thus the District Council hereby certifies that a Land Transaction Return is not applicable in accordance with Section 79(3) of the Finance Act 2003

12. **SEVERABILITY**

If any provision in this Deed shall be held to be invalid illegal or unenforceable the validity legality and enforceability of the remaining provisions hereof shall not in any way be deemed thereby to be affected or impaired

13. **CHARGEES CONSENT**

The First Chargee and the Second Chargee acknowledge and declare that this Deed has been entered into by the First Owner with their consent to the intent that the planning obligations in this Deed shall be binding on the Site and that the security of the respective charges over the Site shall take effect subject to this Deed provided that the First Chargee and the Second Chargee (as applicable) shall only be liable for any breach occurring whilst chargee in possession and shall not be liable for any pre-existing breach.

14. **COUNTERPARTS**

The Parties agree that this Deed may be completed by executed counterparts

SCHEDULE 1

PART 1

NOTICE OF CONSTRUCTION OF ANY PHASE OR PART PHASE

The Owners hereby covenant and agree with the District Council that:

Upon completion of the second brick course above damp proof course of the first Dwelling to be constructed in each Phase or Part Phase they shall serve a Notice of Construction on the District Council in the form set out below:

Notice of Construction

To Horsham District Council
(For the attention of the Head of Legal and Democratic Services)
Parkside, Chart Way,
Horsham,
West Sussex RH12 1RL

**We hereby notify the Horsham District Council that house building in Phase []
was started as follows**

COMMENCEMENT NOTICE	
Phase (e.g. Phase 2)	Date of completion of the second brick course above damp proof course of the first Dwelling to be constructed in the relevant Phase

Signed for and on behalf of

dated

**PART 2
NOTIFICATION NOTICE**

The Owners hereby covenant and agree with the District Council that:

On Occupation of the first Dwelling on the Site and upon each anniversary of the date of Occupation of the first Dwelling until the Development is completed they shall serve a Notification Notice Such Notification Notice will also contain a notification by the Owners to the District Council of an estimate of the programme of construction so that the District Council is aware of when any of the Contributions or instalments are likely to become payable or obligations pursuant to this Deed are likely to arise in each following year

Notification Notice

To Horsham District Council

(For the attention of the Head of Legal and Democratic Services)

Parkside, Chart Way,
Horsham,
West Sussex RH12 1RL

We hereby notify the Horsham District Council of our estimate of the Dwellings likely to be constructed in the next 12 month Period

Estimated Dwellings to be constructed in next 12 month period	Obligations and Contributions likely to be triggered in next 12 month period
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Signed for and on behalf of

dated

**SCHEDULE 2
OPEN SPACES**

**PART 1
NOTES AND DEFINITIONS**

Notes

- i. The area measurements given below exclude water attenuation facilities and areas of existing retained woodland within the defined open spaces
- ii. The defined Open Spaces identified below with the agreement of the Parties may exclude roads/paths cycleways bridleways and related lighting verges and ancillary works and drainage features works culverts streams ditches ponds and other features which may be the subject of separate adoption/management arrangements with parties other than the District Council.

Definitions

Kilnwood Vale Park means an area on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Park (Kilnwood Vale Park)" and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) 1 no natural turf football pitch 4,944m²

Natural turf football pitch, dimensions 96m length x 51.5m width (including 3m runoff areas), with associated pitch markings and goal posts. Full details to be agreed under Reserved Matters Approvals

- (b) 1 no natural turf playing field 26,456m²

playing field area suitable for football and/or rugby and/or hockey, comprising natural turf pitches sized to fit the area, incorporating suitable runoff and outfield areas. To be agreed under Reserved Matters Approvals

- (c) 1 no Pavilion

A single storey sports pavilion and related car parking to be provided on the Site adjacent to the sports pitches described in (a) and (b) above the details and specific location of which shall be approved pursuant to the Reserved Matters Approval. The Pavilion and the relating car parking shall be deemed to form part of the general and informal recreation space in (f) below.

- (d) 1 no young children's play area – 670m²

play areas designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for children's play (ages 2-5 and 6-12 within segregated areas). surface treatment to be grass or a hard surface, together with an impact absorbing safety surface beneath and around play equipment or other structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (e) 1 no teenage adventure play area – 2,110m²

play area designed to provide a stimulating and challenging adventure play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for teenage play (ages 13-19). surface treatment to be grass or a hard surface together with impact absorbing surfaces beneath and around play equipment or structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (f) general and Informal recreational open space – 41,762m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping and incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

- (g) Car Parking

car parking for the Pavilion and for the playing field referred to in (b) and (c) above. full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

- (h) 1 no allotment area – 3,660m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. area to be fenced and gated and hedge. water supply to plots with a surfaced main path .Full details to be agreed under Reserved Matters Approvals

- (i) 1 no allotment area as a Community Green – 1,170m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. area to be fenced and gated and hedge. water supply to plots with a surfaced main path .Full details to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

The Leisure Park means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Leisure Park " and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to

- (a) 2 no natural turf kick-about / ball games area – combined 2,580m²

Comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

- (b)

- 1 no natural turf** kick-about / ball games area as a Community Green – 1,800m²

comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

- (c) 1 no multi-use games area – 666m²

multi use games area suitable for tennis or basketball or netball, dimensions 36.5m length x 18.25m width, comprising a porous macadam, level surface with court markings and enclosed with 3m height ball stop fencing and 2no 1.2m width access gates or access 'slots'. Full details to be agreed under Reserved Matters Approvals

- (d) 1 no young children's' play area – 1,870m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for children's play (ages 2-5 and 6-12) within segregated areas). surface treatment to be grass or a hard surface, together with an impact absorbing safety surface beneath and around play equipment or other structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (e) 1 no teenage play area – 2,650m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as

well as other natural features suitable for children's play (ages 13-19). surface treatment to be grass or a hard surface, together with impact absorbing surfaces beneath and around play equipment or structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (f) General and Informal recreational space – 14,904m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

Or

- (g) 2 no natural turf kick-about / ball games area – combined 2,580m²

Comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

- (h) 1 no natural turf kick-about / ball games area as a Community Green – 1,800m²

comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

- (i) 2 no multi-use games area – combined 1,332m²

multi use games areas suitable for football, tennis or basketball or netball, each of dimensions 36m length x 18m width, comprising a porous macadam, level surface with court markings and enclosed with 3m height ball stop fencing and 2no 1.2m width access gates or access 'slots'. Both MUGAs to be a minimum distance of 10m from the nearest dwelling. Full details to be agreed under Reserved Matters Approvals

- (j) 1 no young children's' play area – 1,870m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for children's play (ages 2-5 and 6-12) within segregated areas). surface treatment to be grass or a hard surface, together with an impact absorbing safety surface beneath and around play equipment or other structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (k) 1 no teenage play area – 2,650m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as other natural features suitable for children's play (ages 13-19). surface treatment to be grass or a hard surface, together with impact absorbing surfaces beneath and around play equipment or structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (l) General and Informal recreational space – 14,238m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

The option to be implemented for the provision of leisure facilities within the Leisure Park shall be agreed in consultation with Horsham District Council.

The Knoll Neighbourhood Park means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Neighbourhood Park (the Knoll) " and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to

- (a) General and Informal recreational space – 3,170m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

- (b) 1 no young children's play area as a Community Green – 700m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural features suitable for children's play (ages 2-5). surface treatment to be grass or a hard surface together with impact absorbing surfaces beneath and around play equipment or structures as appropriate. Full details to be agreed under reserved matters.

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals

The Viewpoint Neighbourhood Park means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Neighbourhood Park (the Viewpoint) " and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) 1 no natural turf kick-about / ball games area – 1,434m²

comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals
- (b) 1 no young children's play area – 700m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for children's play (ages 2-5 and 6-12) in segregated areas. surface treatment to be grass or a hard surface, together with an impact absorbing safety surface beneath and around play equipment or other structures as appropriate. full details to be agreed under Reserved Matters Approvals
- (c) 1 no allotment area – 2,000m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. area to be fenced, hedged and gated. water supply to plots to be provided with a surfaced main path. Full details to be agreed under Reserved Matters Approvals
- (d) 1 no multi use games area – 666m²

multi use games area suitable for tennis or basketball or netball, dimensions 36.5m length x 18.25m width, comprising a porous macadam, level surface with court markings and enclosed with 3m height ball stop fencing and 2no 1.2m width access gates or access 'slots'. Full details to be agreed under Reserved Matters Approvals
- (e) General and informal recreational space – 5,600m².

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

Or

1 no natural turf kick-about / ball games area – 1,640m²

comprising a reasonably level grassed area suitable for informal ball games Full details to be agreed under Reserved Matters Approvals.

1 no natural turf kick-about / ball games area – 1,934m²

comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

1 no multi use games area – 666m²

multi use games area suitable for tennis or basketball or netball, dimensions 36.5m length x 18.25m width, comprising a porous macadam, level surface with court markings and enclosed with 3m height ball stop fencing and 2 no 1.2m width access gates or access 'slots'. Full details to be agreed under Reserved Matters Approvals

1 no young children's play area – 600m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural play features suitable for children's play (ages 2-5 and 6-12) in segregated areas. Surface treatment to be grass or a hard surface, together with an impact absorbing safety surface beneath and around play equipment or other structures as appropriate. Full details to be agreed under Reserved Matters Approvals

1 no allotment area – 1,000m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. Area to be fenced, hedged and gated. Water supply to plots to be provided with a surfaced main path. Full details to be agreed under Reserved Matters Approvals

general and informal recreational space – 4,560m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

The option to be implemented for the provision of leisure facilities within The Viewpoint Neighbourhood Park shall be discussed and agreed in consultation with Horsham District Council.

Kilwood Green means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation " Community Green (Kilwood Green) " and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

1 no natural turf kick-about / ball games area – 1,800m²

comprising a reasonably level grassed area suitable for informal ball games. Full details to be agreed under Reserved Matters Approvals

1 no young children's play area – 700m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural features suitable for children's play (ages 2-5). surface treatment to be grass or a hard surface together with impact absorbing surfaces beneath and around play equipment or structures as appropriate. Full details to be agreed under reserved matters.

1 no allotment area – 1,170m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. area to be fenced and gated and hedge. water supply to plots with a surfaced main path .Full details to be agreed under. Reserved Matters Approvals

general and informal recreational space – 900m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

Or

(a) 1 no young children's play area – 700m²

play area designed to provide a stimulating and challenging play experience containing a minimum of 5 items of fixed play equipment as well as natural features suitable for children's play (ages 2-5). surface treatment to be grass or a hard surface together with impact absorbing surfaces

beneath and around play equipment or structures as appropriate. Full details to be agreed under Reserved Matters Approvals

- (b) 1 no allotment area – 2,000m²

area set aside for provision of allotments or community gardens. soils to be naturally occurring and cultivated. area to be fenced and gated and hedge. water supply to plots with a surfaced main path. Full details to be agreed under Reserved Matters Approvals

- (c) general and informal recreational space – 1,870m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

The option to be implemented for the provision of leisure facilities within Kilnwood Green shall be discussed and agreed in consultation with Horsham District Council.

Community Greens means an area or areas on the Site to be located and laid out to accommodate specific recreational features and/or facilities as identified within the defined Open Spaces and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Community Greens" and by dashed black edging on the Open Spaces Strategy and Phasing Plan.

West Greenway means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation "Greenwood Corridor (West Greenway)" and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) general and informal recreational space – 14,696m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

- (b) 1 no fitness / trim trail area – 550m²

trim trail suitable for fitness training and exercises containing fixed equipment and/or natural features. Full details to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

Central Greenway means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification by the notation “Green Corridor (Central Greenway)” and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) general and informal recreational space – 7,230m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

East Greenway means an area or areas on the Site to be located and laid out and thereafter maintained in accordance with the Open Space Specification shown for the purposes of identification only by the notation “Green Corridor (East Greenway)” and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) 1 no fitness / trim trail area – 479m²

trim trail suitable for fitness training and exercises containing fixed equipment and/or natural features. Full details to be agreed under Reserved Matters Approvals

- (b) 1 no fitness / trim trail area as a Community Green – 417m²

trim trail suitable for fitness training and exercises containing fixed equipment and/or natural features. Full details to be agreed under Reserved Matters Approvals

- (c) general and informal recreational space – 14,106m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

- (d) general and informal recreational space as a Community Green– 1,130m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

Bewbush Brook means an area of Open Space within each Phase or Part Phase of the Site to be located and laid out and thereafter maintained as such in accordance with the Open Space Specification shown for the purposes of identification only by the notation " Green Corridor (Bewbush Brook)" and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) general and informal recreational space (including the span of the watercourse) – 39,530m²

open space for the purpose of general and informal recreation, comprising areas of hard and soft landscaping incorporating street furniture, low level lighting, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

Green Corridors North of Railway 1 means an area of Open Space within each Phase or Part Phase of the Site to be located and laid out and thereafter maintained as such in accordance with the Open Space Specification shown for the purposes of identification by the notation " Green Corridor (North of the Railway - Area 1)" and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to:

- (a) general and informal recreational space – 18,585m²

areas of soft landscaping to safeguard root protection zones and stand-off requirements for existing trees and hedgerows retained and to enhance the

local bio-diversity. where appropriate, areas of hard landscaping may be provided incorporating street furniture, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

Green Corridors North of Railway 2 means an area of Open Space within each Phase or Part Phase of the Site to be located and laid out and thereafter maintained as such in accordance with the Open Space Specification shown for the purposes of identification by the notation "Green Corridor (North of the Railway - Area 2)" and by dashed black edging on the Open Spaces Strategy and Phasing Plan which shall include but not be limited to

- (a) general and informal recreational space – 30,195m²

areas of soft landscaping to safeguard root protection zones and stand-off requirements for existing trees and hedgerows retained and to enhance the local bio-diversity. Where appropriate, areas of hard landscaping may be provided incorporating street furniture, footpaths, and cycleways and equestrian routes where applicable. Full details of surface treatment of hard landscaping and details of soft landscaping to be agreed under Reserved Matters Approvals

or such alternative leisure facilities within the relevant area as may be submitted to and approved by the District Council under Reserved Matters Approvals.

Capon Grove means the areas of existing woodland to be retained and managed in accordance with the Permission and the landscape management plans which shall include sensitively designed surfaced footpath routes, woodland furniture including benches, signage and interpretation boards, and post and rail fencing around both woodlands with gates to be provided. shown for the purposes of identification only by the notation "Capon" by dashed black edging on the Open Spaces Strategy and Phasing Plan. Full details to be agreed under Reserved Matters Approvals

Pondtail Shaw means areas of existing woodland to be retained and managed in accordance with planning conditions and the landscape management plans which shall include sensitively designed surfaced footpath routes, woodland furniture including benches, signage and interpretation boards, and post and rail fencing around both woodlands with gates to be provided. shown for the purposes of identification only by the notation "Pondtail Shaw" and by dashed black edging on the Open Spaces Strategy and Phasing Plan. Full details to be agreed under Reserved Matters Approvals

SCHEDULE 2

PART 2 OPEN SPACES

The Owners hereby covenant and agree with the District Council as follows

1. to provide lay out equip and maintain the Open Spaces within the Site in accordance with the Open Spaces Specification
2. To continue to maintain the Open Spaces until such time as they are transferred to the District Council and to make them available for use
3. Upon completion of an area of open space within the Open Spaces the Owners may serve an Open Spaces Notice upon the District Council's Head of Community and Culture or such other nominated officer in writing requesting transfer of the area to the District Council or its nominee
4. Within two months of receipt of such a notice the District Council will arrange to inspect the area to ascertain compliance with the provisions of Paragraph 1 of this Part 2 of Schedule 2 in relation to the relevant part of the Open Spaces
5. Within one month of the site visit the District Council's Head of Community and Culture or such other nominated officer will serve upon the Owners either an Open Spaces Completion Certificate in the event that it is satisfied with the works or an Open Spaces Provisional Certificate in the event that in the view of the District Council there are outstanding works. in which case the procedures in Paragraphs 3 to 5 shall be repeated until an Open Spaces Completion Certificate shall have been issued by the District Council
6. Upon receipt by the Owners of an Open Spaces Provisional Certificate (if any) the Owners will immediately comply with the requirements contained therein
7. Upon the District Council being satisfied that the works specified in the Open Space Provisional Certificate (if any) have been carried out to its satisfaction the District Council will issue the Open Space Completion Certificate for the relevant area of the Open Spaces.
8. Within two months of the service of an Open Spaces Completion Certificate by the District Council upon the Owners shall deliver to the District Council or its nominee a duly executed transfer substantially in the form of the draft Transfer annexed as Schedule 8 Part 1 for the sum of £1 for the agreed area of Open Space defined in the Open Spaces Completion Certificate.
9. The District Council's or its nominee's reasonable legal costs in respect of the transfer shall be paid

Provided Always that:

- 9.1 Unless otherwise agreed with the District Council in writing the Owners MUST have transferred the Open Spaces to the District Council or its nominee in Phases, 2 and 3 of the Development prior to the Occupation of the 1009th Dwelling to be Occupied and
 - 9.2 the Owners MUST have transferred the Open Spaces to the District Council or its nominee in Phases 4 and 5 of the Development prior to the Occupation of the 1909th Dwelling to be Occupied.
 - 9.3 Not to Occupy or cause or allow to be Occupied more than 1008 Dwellings unless the Open Spaces within Phases 2 and 3 have been transferred to the District Council or its nominee
 - 9.4 Not to Occupy or cause or allow to be Occupied more than 1908 Dwellings unless the Open Spaces within Phases 4 and 5 have been transferred to the District Council or its nominee
10. Upon delivery of the executed transfer referred to in Paragraph 8 to pay to the District Council or its nominee:
- 10.1 the Tariff together with any sum payable pursuant to Clause 4.20 of this Deed towards the maintenance of the Open Spaces or part thereof
 - 10.2 To pay the District Council's or its nominee's reasonable legal costs in respect of each transfer
11. On the District Council being satisfied that the Owners have complied with the provisions of Paragraphs 8 and 9 of this Part 2 of Schedule 2 the District Council hereby covenants and agrees with the Owners to complete the Open Spaces Transfer or request that the nominee does.

SCHEDULE 2

PART 3 SUDS

The Owners hereby covenant and agree with the District Council:

1. To construct and provide at its own expense the SUDS within the Site in accordance with the SUDS Specification
2. To maintain the SUDS in accordance with the SUDS Specification until such time as they are transferred to the District Council or its nominee
3. Upon completion of the SUDS or any one of them the Owners may serve an Open Spaces Notice upon the District Council's Head of Community and Culture or such other nominated officer requesting transfer of the SUD or SUDS to the District Council or its nominee.
4. Within two months of receipt of such a notice the District Council will arrange to inspect the SUD or SUDS to ascertain compliance with the provisions of Paragraph 1 in relation to the relevant SUD
5. Within one month of the site visit the District Head of Community and Culture or such other nominated officer serve upon the Owners either an Open Spaces Completion Certificate in the event that it is satisfied with the works or an Open Spaces Provisional Certificate in the event that in the view of the District Council there are outstanding works. in which case the procedures in Paragraphs 3 to 5 shall be repeated until an Open Spaces Completion Certificate shall have been issued by the District Council
6. Upon receipt by the Owners of an Open Spaces Provisional Certificate (if any) the Owners will immediately comply with the requirements contained therein
7. Upon the District Council being satisfied that the works specified in the Open Space Provisional Certificate (if any) have been carried out to its satisfaction the District Council will issue the Open Space Completion Certificate for the relevant SUDs.
8. Within two months of the service of an Open Spaces Completion Certificate by the District Council upon the Owners the Owners shall deliver to the District Council or its nominee a duly executed SUDS Transfer substantially in the form of the draft Transfer annexed as Schedule 8 Part 2 for the sum of £1 for the SUD or SUDS defined in the Open Spaces Completion Certificate and the District Council's reasonable legal costs in respect of the transfer shall be paid.

Provided Always that:

- 8.1 Unless otherwise agreed in writing with the District Council the Owners MUST have transferred the SUDS to the District Council or its nominee in Phases 1D, 2 and 3 of the Development prior to the Occupation of the 1009th Dwelling to be Occupied and
- 8.2 the Owners MUST have transferred the SUDS to the District Council or its nominee in Phases 4 and 5 of the Development prior to the Occupation of the 1909th Dwelling to be Occupied.
- 8.3 not to Occupy or cause or allow to be Occupied more than 1008 Dwellings unless the SUDS within Phases 1D, 2 and 3 have been transferred to the District Council or its nominee
- 8.4 not to Occupy or cause or allow to be Occupied more than 1908 Dwellings unless the SUDS within Phases 4 and 5 have been transferred to the District Council or its nominee
9. Upon delivery of the executed transfer referred to in Paragraph 8 to pay to the District Council or its nominee:
 - 9.1 the Tariff towards the maintenance of the SUDS or part thereof
 - 9.2 to pay the District Council's or its nominee's reasonable legal costs in respect of each transfer
10. on the District Council being satisfied that the Owners have complied with the provisions of Paragraphs 8 and 9 of Part 3 of this Schedule 2 the District Council hereby covenants and agrees with the Owners to complete the SUDS Transfer or request that its nominee does
11. in the event that the provisions of the Flood and Water Management Act 2010 or the Water Act 2003 or any other legislation or enactment requires that the SUDS or any part of them be designed or constructed in accordance with the requirements of and/or transferred to or adopted by the SUDS Approving Body or the Water and Sewerage Company or any other body then the provisions of this Schedule 2 Part 3 paragraphs 1 to 9 shall cease to apply in so far as they have not previously been complied with

SCHEDULE 3

PART 1 COMMUNITY BUILDING

The Owners hereby covenant and agree with the District Council to comply with paragraphs 1-5 below

1. To submit the Community Building Specification to the District Council for its approval setting out such details as the District Council may reasonably require prior to Commencement of Phase 3
2. To construct the Community Building in accordance with the approved Community Building Specification prior to the Occupation of 1159 Dwellings
3. Not to occupy more than 1158 Dwellings until the Community Building shall have been completed to the satisfaction of the District Council in accordance with the Community Building Specification
4. To continue to maintain the Community Building until the same shall have been transferred to the District Council pursuant to paragraphs 5 and 6 below
5. Not to occupy more than 1208 Dwellings until the Community Building has been transferred to the District Council for the sum of (one pound) £1 in accordance with the Community Building Transfer as set out in Schedule 8 Part 3 and the District Council's reasonable legal costs in respect of the transfer have been paid.
6. that upon the District Council being satisfied that the provisions of this Part 1 of Schedule 3 have been satisfied and upon receipt of a duly executed Community Building Transfer the District Council hereby covenants and agrees with the Owners to complete the Community Building Transfer

SCHEDULE 3

PART 2 PAVILION

The Owners hereby covenant and agree with the District Council to comply with paragraphs 1-5 below

1. to submit the Pavilion Specification to the District Council for its approval setting out such details as the District Council may reasonably require prior to Commencement of Phase 3
2. to construct the Pavilion in accordance with the approved Pavilion Specification prior to the Occupation of 1159 Dwellings
3. not to occupy more than 1158 Dwellings until the Pavilion shall have been completed in accordance with the Pavilion Specification to the satisfaction of the District Council
4. to continue to maintain the Pavilion until the same shall have been transferred to the District Council pursuant to Paragraphs 5 and 6 below
5. not to occupy more than 1208 Dwellings until the Pavilion has been transferred to the District Council for the sum of (one pound) £1 in accordance with the Open Space Transfer (including the Pavilion) as set out in Schedule 8 Part 1 and the District Council's reasonable legal costs in respect of the transfer have been paid.
6. that upon the District Council being satisfied that the provisions of this Schedule have been satisfied and upon receipt of a duly executed Open Space Transfer (including the Pavilion) the District Council hereby covenants and agrees with the Owners to complete the Open Space Transfer (with Pavilion)

**SCHEDULE 4
AFFORDABLE HOUSING**

Unless otherwise agreed in writing by or on behalf of the District Council the Owners hereby covenant and agree with the District Council:

1. AMOUNT OF AFFORDABLE HOUSING UNITS

- 1.1 that no less than 35% of the total number of Dwellings constructed on Phase 1D in accordance with the Phase 1D Application shall be Phase 1D Affordable Housing Units
- 1.2 that 25% of the total number of Dwellings constructed on Phase 2 shall be Affordable Housing Units
- 1.3 that 25% of the total number of Dwellings constructed on Phase 3 shall be Affordable Housing Units
- 1.4 that 36% of the total number of Dwellings constructed on Phase 4 shall be Affordable Housing Units
- 1.5 that 36% of the total number of Dwellings constructed on Phase 5 shall be Affordable Housing Units
- 1.6 that 40% of the total number of any Dwellings constructed on the Reserve Land shall be Affordable Housing Units

and where the percentage requirement does not result in a whole number of Affordable Housing Units the number of Affordable Housing Units shall be rounded upwards or downwards to the nearest whole Affordable Housing Unit (with 0.5 or over being rounded upwards and anything less than 0.5 of being rounded downwards):

2 AFFORDABLE HOUSING MIX

- 2.1 that the dwelling mix of the Phase 1D Affordable Housing Units in Phase 1D shall conform with the Phase 1D Affordable Housing Plan and the mix set out in Schedule 13 or any amendment thereto which shall previously have been agreed by the District Council in writing
- 2.2 that the following dwelling mix shall apply to the Affordable Housing Units in each of the Phases 2 3 4 and 5 of the Development and the Reserve Land - or any amendment to the said dwelling mix which shall previously have been agreed by the District Council in writing

Mix of the Affordable Housing Units in each of Phases 2 3 4 and 5 and the Reserve Land	Dwelling Type
25% of the Affordable Housing Units in each Phase 2 3 4 and 5 and the Reserve Land shall be	1 bedroom flats
25% of the Affordable Housing Units in each Phase 2 3 4 and 5 and the Reserve Land shall be	2 bedroom flats
25% of the Affordable Housing Units in each Phase 2 3 4 and 5 and the Reserve Land shall be	2 bedroom houses
15% of the Affordable Housing Units in each Phase 2 3 4 and 5 and the Reserve Land shall be	3 bedroom houses
10% of the Affordable Housing Units in each Phase 2 3 4 and 5 and the Reserve Land shall be	4 bedroom houses

and where the percentage requirement does not result in a whole number of Affordable Housing Units the number of Affordable Housing Units in each dwelling type shall be rounded upwards or downwards to the nearest whole Affordable Housing Unit (with 0.5 or over being rounded upwards and anything less than 0.5 of being rounded downwards)

3 CLUSTERING

3.1 that the clustering of Phase 1D Affordable Housing Units in Phase 1D shall accord with the Phase 1D Affordable Housing Plan

3.2 that in respect of Phases 2, 3, 4, 5 and the Reserve Land:

3.2.1 each cluster of Affordable Housing Units in any Phase or the Reserve Land shall contain no more than 30 Affordable Housing Units

3.2.2 there will be at minimum of two clusters of Affordable Housing Units in each Phase

3.2.3 each cluster will be physically separate from any other cluster of Affordable Housing Units in that Phase or any other Phase

4 TYPE AND TENURE

4.1 The number type and tenure of the Affordable Housing Units in Phase 1D will be as defined as the Phase 1D Affordable Housing Units and in accordance with the Phase 1D Affordable Housing Plan

4.2 to identify with each Reserved Matters Submissions for any of Phases 2 3 4 or 5 or the Reserve Land (or for any Part-Phase thereof which includes Affordable Housing Land) the Affordable Housing Units in that Phase or Part-Phase or the Reserve Land (together with the affordable housing schedule for that Phase) identifying:

4.2.1 the number;

4.2.2 the tenure (i.e. Affordable Rented Units Alternate Tenure Units and Shared Ownership/Intermediate Units);

4.2.3 the type (i.e. 1 2 and/or 3 bedroom flats or 2 3 and/or 4 bedroom Houses)

of the balance of the Affordable Housing Units proposed to be contained in the remainder of that Phase

4.3 that the Affordable Housing Units contained within each Phase or the Reserve Land and the Phase 1D Affordable Housing Units shall be in accordance with the Affordable Housing Mix or the Phase 1D Affordable Housing Plan respectively unless otherwise agreed in writing by or on behalf of the District Council

5 WHEELCHAIR UNITS

5.1 Save in respect of the Phase 1D Affordable Housing Units that 2% of the total number of Affordable Housing Units shall be Wheelchair Units

5.2 to identify the Wheelchair Units on the Reserved Matters Application for each Phase of the Development (including the Reserve Land)

6 RESTRICTIONS ON DISPOSALS:

6.1 subject to the application of the Fall Back Position (except for Phase 1D where it does not apply) and the provisions of Clause 4.8 and save as otherwise provided in this Schedule not to dispose of or cause or allow the disposal of any Affordable Housing Unit or Phase 1D Affordable Housing Unit to individual purchasers tenants or occupiers other than;

6.1.1 as Shared Ownership/Intermediate Housing Units (in Phases 2 to 5 and Reserve Land)

6.1.2 as Shared Ownership Units in Phase 1D; or

6.1.3 as Affordable Rented Units in Phases 1D, 2 to 5 and the Reserve Land; or

6.1.4 by way of an assured tenancy complying with the guidance given by the HCA under the Housing Act 1996 Section 36 or such other form of occupancy agreement approved for use by an Appointed Registered Provider by the HCA; or

6.1.5 by way of shared ownership lease or under the Government's Help to Buy Scheme (or under similar arrangements to the Government's Help to Buy Scheme) or under discounted purchase arrangements or as intermediate affordable housing as described and defined Annex 2 of the National Planning Policy Framework (NPPF March 2012)

and to an individual residential purchaser tenant or occupant who satisfies the qualifications set out below namely that the one or more of the person(s) who are to occupy an Affordable Housing Unit or a Phase 1D Affordable Housing Unit

(e) is an individual or are individuals

(f) is or are a Nominee(s) or considered by the District Council or the Appointed Registered Provider in accordance with its rules or its allocations and lettings policies to be in need of the accommodation provided by the Affordable Housing Unit; or

(g) is not able easily to compete in the open market for equivalent housing accommodation in the administrative area of the District Council ; or

(h) before taking up occupation of the Affordable Housing Unit or a Phase 1D Affordable Housing Unit has not owned a freehold or a lease for a term exceeding 3 years within the previous 12 months (save that the condition shall not apply where the District Council or the Affordable Housing Provider is satisfied that the circumstances of that person are such as to put him in need of housing) and intends to occupy and subsequently occupies the Affordable Housing Unit or Phase 1D Affordable Housing Unit as his or their only or principal home; or

(i) has a Local Connection;

or

6.1.6 by way of any statutory or contractual right to buy or the preserved right to buy/acquire under the Housing Associations Act 1985 or the right to buy /acquire under the Housing Act 1996 or otherwise by way of any statutory or contractual right to buy/acquire or the preserved right to buy/acquire under the Housing Associations Act 1985 or the right to buy/acquire under the Housing Act 1996 or otherwise or any right to "staircase" to full freehold or

leasehold ownership by the acquisition of additional equity in the Affordable Housing Unit or Phase 1D Affordable Housing Unit ; or

6.1.7 under the Fall Back Position for phases 2 to 5 and Reserve Land only.

7 TENURE

Unless otherwise agreed in writing by the District Council the Owners hereby covenant and agree with the District Council and the District Council hereby agrees with the Owners as follows:

Shared Ownership/Intermediate Units

7.1 that 30% of the Affordable Housing Units in each Phase (except Phase 1D) shall be designated as Shared Ownership/Intermediate Affordable Housing Units

7.2 that no more than 30% of the Phase 1D Affordable Housing Units shall be designated as Shared Ownership Units

Affordable Rented Units

7.3 that 30% of the Affordable Housing Units in each Phase (except Phase 1D) shall be designated as Affordable Rented Units

7.4 that no less than 70% of the Phase 1D Affordable Housing Units shall be designated as Affordable Rented Units

Alternate Tenure Affordable Units

7.5 that 40% of the Affordable Housing Units in each Phase (except Phase 1D) shall be designated as Alternate Tenure Affordable Units

7.6 that the tenure of the Alternate Tenure Affordable Units shall be determined through the application of the procedures contained in Paragraph 8

8 BIDDING AND CASCADE PROCEDURES AND FALL BACK POSITION IF DISPOSAL ON STANDARD TERMS CANNOT BE ACHIEVED (NOT APPLICABLE TO PHASE 1D)

Unless otherwise agreed in writing by the District Council the Owners hereby covenant and agree with the District Council that

8.1 at least 1 month prior to submission of Reserved Matters Submissions for the Dwellings contained in any other Phase or Part-Phase (or the Reserve Land) containing Affordable Housing Units to:

8.1.1 notify the District Council in writing of up to three Affordable Housing Providers selected by the Owner from the District Council's approved list of affordable housing providers (assuming that there are three providers on

the list) to whom the Owners will market the Affordable Housing Units in that Phase of the Development at the Affordable Housing Unit Prices set out at Schedule 10

- 8.1.2 invite bids for the Affordable Housing Units in that Phase from such Affordable Housing Providers on the Standard Terms at the Affordable Housing Unit Price and requiring them to indicate their ability or inability to provide the Alternate Tenure Affordable Units as Affordable Rented Units whilst still maintaining the Affordable Housing Unit Price of 75% of Open Market Value of those Dwellings
- 8.2 if following the invitations under Paragraph 8.1.2 no bids to acquire the Affordable Housing Units on the Standard Terms are received from an Affordable Housing Provider on the Standard Terms at the Affordable Housing Unit Price within 3 months following the invitation of bids under Paragraph 8.1.2 THEN the Owners shall notify the District Council in writing that there are no such bids and shall invite the District Council to nominate an alternative Affordable Housing Provider, and
- 8.3 if the District Council nominates such an alternative Affordable Housing Provider within one month of such notification the Owners shall invite such Affordable Housing Provider to bid for the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price within a further three months of the said invitation;
- 8.4 if only one bid pursuant to the invitations under Paragraph 8.1.2 on the Standard Terms at the Affordable Housing Unit Price is received from the Affordable Housing Providers the Owners shall notify the District Council in writing
- 8.5 if bids pursuant to the invitations under Paragraph 8.1.2 to acquire the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price are received from two Affordable Housing Providers then the Owners shall
- (a) notify the District Council in writing of the identity of the bidders and details of the bids and give the District Council 10 Working Days to notify the Owner on its preferred choice of Affordable Housing Provider (having regard to the need to maximise the amount of Affordable Rented Housing Units);
 - (b) take into account the District Council's preference when deciding with which of the two Affordable Housing Providers it wishes to deal and
 - (c) in any event to notify the District Council in writing of its selected Affordable Housing Provider
- 8.6 if bids pursuant to the invitations under Paragraph 8.1.2 to acquire the Alternate Tenure Affordable Units on the Standard Terms at the Affordable Housing Unit Price are received from all three Affordable Housing Providers THEN the Owners shall
- 8.6.1 notify the District Council of the identity of the bidders and details of the bids and to give the District Council 10 Working Days to notify the Owner

of its preferred choice of Affordable Housing Provider having regard to the need to maximise the amount of Affordable Rented Housing Units and in such written notifications both the Owner and the District Council (as the case may be) may reject one such Affordable Housing Provider and express its preference as between the other two; and

- 8.6.2 not transact with the Affordable Housing Provider which the District Council shall have rejected; and
 - 8.6.3 take into account the District Council's preference when deciding which of the remaining 2 Affordable Housing Providers it wishes to deal; and
 - 8.6.4. notify the District Council in writing of the Owner's selected Affordable Housing Provider
 - 8.6.5 supply the District Council on receipt of its written request so to do with a copy of any bids received pursuant to the procedure set out in this part of this Schedule
- 8.7 if the purchase of the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price is not supported by Grant Funding sufficient to enable the Affordable Housing Provider to purchase all or any Alternate Tenure Affordable Units on the Standard Terms at the Affordable Housing Unit Price then the Alternate Tenure Affordable Units which are not so supported by Grant Funding shall be reserved for disposal by an Affordable Housing Provider to individual purchasers as Shared Ownership/ Intermediate Affordable Units
- 8.8 if the purchase of all or any of the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price IS supported by sufficient Grant Funding to enable the Affordable Housing Provider to purchase any such Alternate Tenure Affordable Units on the Standard Terms at the Affordable Housing Unit Price whilst also enabling them to be let as Affordable Rented Units THEN:
- 8.8.1 those Alternate Tenure Affordable Units for which such Grant Funding is available shall be let as Affordable Rented Units and
 - 8.8.2 any remaining Alternate Tenure Affordable Units shall be Shared Ownership/Intermediate Affordable Units

9. DELIVERY SERVICING AND USE OF THE AFFORDABLE HOUSING UNITS AND THE PHASE 1D AFFORDABLE HOUSING UNITS

The Owners hereby covenant and agree with the District Council

- 9.1 not to Occupy or cause or allow the Occupation of:
 - 9.1.1 more than 50% of the Open Market Units in any Phase until contract or contracts have been exchanged with the Affordable Housing Provider for the

sale and purchase on the Standard Terms of the Affordable Housing Units in that Phase or the Fall Back Position shall have occurred

9.1.2 more than 80% of the Open Market Units in any Phase before the freehold or the long leasehold interest of the Affordable Housing Units in that Phase shall have been transferred to an Affordable Housing Provider and shall be available for Occupation and has delivered written evidence of that transfer (s) to the District Council or the Fall Back Position shall have occurred

9.1.3 more than 50% of the Open Market Units in Phase 1D until contract or contracts have been exchanged with the Affordable Housing Provider for the sale and purchase of the Phase 1D Affordable Housing Units

9.1.4 more than 75% of the Open Market Units in Phase 1D before the freehold or the long leasehold interest of the Phase 1D Affordable Housing Units shall have been transferred to an Affordable Housing Provider and shall be available for Occupation and has delivered written evidence of that transfer (s) to the District Council shall have occurred

9.2 to ensure that the Affordable Housing Units and the Phase 1D Affordable Housing Units are Fully Serviced and to provide vehicular access conduits and other infrastructure for the passage of foul and surface water drainage and water electricity (and gas, if appropriate) and telecommunication service systems to the Affordable Housing Units and the Phase 1D Affordable Housing Units linking in each case to the estate roads sewers and telecommunication service systems to be constructed and laid as part of the remainder of the Development and connected to highways and sewers maintainable at the public expense

9.3 save as otherwise provided and subject always to the provisions of Paragraphs 12 and 17 not to use or allow the Affordable Housing Units and the Phase 1D Affordable Housing Units to be used for any purpose other than for Affordable Housing

10 FALL BACK POSITION (NOT APPLICABLE TO PHASE 1D) -

Unless otherwise agreed in writing by the District Council the Owners and the District Council hereby covenant and agree with each other as follows

10.1 if no bids to acquire the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price are received from the selected Affordable Housing Providers within the 3 month periods following the invitation of bids under Paragraphs 8.1.2 or (if applicable) under 8.3 ;or

10.2 if having received bids from an Affordable Housing Provider under Paragraph 8.1.2 or (if applicable) 8.3 to acquire such Affordable Housing Units within the 3 month period on the Standard Terms at the Affordable Housing Unit Price the selected Affordable Housing Provider fails to exchange contracts for sale or an agreement for lease on the Standard Terms within 3 months of the notification of their selection to the District Council; or

10.3 if having exchanged contracts to acquire the Affordable Housing Units on the Standard Terms at the Affordable Housing Unit Price within the three month period referred to in Paragraph 10.2 above the Affordable Housing Provider fails to complete the purchase on those terms

THEN in any of these three cases the Owners shall notify the District Council in writing and may thereafter at their complete discretion either:

- (a) market and dispose of the Affordable Housing Units to one or more Affordable Housing Providers of the Owners' choice as Shared Ownership/Intermediate Units on the Standard Terms; and/or
- (b) at any time thereafter they may themselves dispose of all or any such Affordable Housing Units to individual purchasers as Shared Ownership/ Intermediate Affordable Housing with priority being given in the first 8 weeks from first marketing of such units directly to individual purchasers to persons having a Local Connection
- (c) in the event of any disposals under sub paragraph (b) the Affordable Housing Units may be transferred either:
 - (i) by way of Shared Ownership /Intermediate Units in accordance with a shared ownership lease where the ability to staircase is precluded and the percentage of the equity acquired by the purchaser does not exceed 75% in the case of the Shared Ownership/Intermediate and Alternate Tenure Housing Affordable Units and does not exceed 60% in the case of units identified as Affordable Rented Units; or
 - (ii) under arrangements whereby:
 - (A) any Shared Ownership/Intermediate Housing Units or Alternate Tenure Affordable Housing Units may be sold by either freehold or leasehold disposal at a permanently discounted price not exceeding 75% of the prevailing Open Market Value of the Affordable Housing Unit at the time of initial disposal and which discounted price of 75% Open Market Value shall be recalculated by an independent valuer appointed by the Owner by reference to the Open Market Value at the time of any subsequent resale or assignment
 - (B) any Affordable Rented Housing Units may be sold by either freehold or leasehold disposal at a permanently discounted price not exceeding 60% of the prevailing Open Market Value of the Affordable Housing Unit at the time of initial disposal and which discounted price of 60% of Open Market Value shall be recalculated by

an independent valuer appointed by the Owner by reference to the Open Market Value at the time of any subsequent resale or assignment

PROVIDED ALWAYS THAT the Owners shall in any event notify and consult with the District Council before marketing the Affordable Housing Units directly to individual purchasers under Paragraph (b) above

11. NOMINATION RIGHTS

The Owners hereby covenant and agree with the District Council

11.1 to procure that the terms of any contract or agreement to transfer any interest in an Affordable Housing Unit and a Phase 1D Affordable Housing Unit to an Affordable Housing Provider shall provide that:

11.1.1 In respect of 100% of all first lettings and 75% of all subsequent lettings of all or any Affordable Rented Units or any other type of rented Affordable Housing that the District Council shall be granted the right to nominate the occupiers of the Affordable Rented Units to the Affordable Housing Provider pursuant to the Nominations Agreement (Affordable Rented)

11.1.2 to procure the execution by the Affordable Housing Provider and to deliver to the District Council the Nominations Agreement (Affordable Rented)

11.2 to procure that the terms of any contract or agreement to transfer any interest in an Affordable Housing Unit to an Affordable Housing Provider shall provide that:

11.2.1 in respect of all disposals of the Shared Ownership/Intermediate Units the Help to Buy Agent (or any successor body) shall be entitled to refer potential occupiers to the Affordable Housing Provider - it being acknowledged that the preferred candidates for nomination have a Local Connection

12. RIGHTS TO BUY / RIGHTS TO STAIRCASE / RIGHTS TO ACQUIRE

It is hereby agreed and declared between the Owners and District Council hereby covenant and agree with each other and declare that

12.1 any Affordable Housing Unit and Phase 1D Affordable Housing Unit in respect of which a tenant exercises any statutory or contractual right to acquire or right to buy or any Shared Ownership/Intermediate Unit in respect of which the lessee shall have staircased to 100% equity share and (in either case) the tenant or lessee (as the case may be) acquires a freehold or long leasehold interest in the same so that such tenant or lessee or mortgagee shall be entitled to dispose of such Affordable Housing Unit thereafter free from the covenants and obligations set out in this Agreement and so

that any person deriving title through or under such tenant or lessee or mortgagee shall not be bound by this Schedule 4

13. STANDARD OF CONSTRUCTION

The Owners hereby covenant and agree with the District Council

- 13.1 not to construct the Affordable Housing Units or Phase 1D Affordable Housing Units in any Phase or Phase 1D or on the Reserve Land other than in accordance with the Affordable Housing Specification

14. GRANT FUNDING

The Owners hereby covenant and agree with the District Council in respect of the Affordable Housing Units in Phases 2, 3, 4, 5 and Reserve Land

- 14.1 to provide the Affordable Housing Units without the aid of Grant Funding provided that Grant Funding may be sought and if secured; shall be used in the first instance to enable the Alternate Tenure Affordable Units to be used as Affordable Rented Units and thereafter to provide specialist affordable housing such as extra care housing unless otherwise agreed by the District Council or Grant Funding has been approved for use solely for a particular purpose

15. APPLICATION OF THE MORATORIUM PROVISIONS UNDER THE HOUSING ACT 1996

The Owners hereby covenant and agree with the District Council

- 15.1 to notify the District Council immediately in the event of service of any notice under the Housing Act 1996 Sections 40 and 41 of or any notice order or direction served made or given under the Housing Act 1996 Schedule 1 Part IV of the Housing Regeneration Act 2008

16. REMEDIATION SAVINGS TO BE APPLIED TO CHANGE OF TENURE

The Owners hereby covenant and agree with the District Council

- 16.1 Upon Occupation of the last of the Dwellings in Phases 1D 2 and 3:

16.1.1 to supply to the District Council full details of their costings of and relating to the Remediation Work including certified copies of all invoices for any such works and any related professional fees design and monitoring costs fees charges or payments together with any such other supporting documents which the District Council may reasonably require

16.1.2 on receipt from the District Council of any reasonable request to provide any clarification or additional or supplemental evidence or information to supply the same to the District Council within 14 Working Days of the date of such written request

- 16.1.3 If the District Council shall not have served notice on the Owner within 30 Working Days of receipt of all of the information it shall have requested then the costings shall be deemed to have been agreed by the District Council
- 16.1.4 if the costings as agreed or determined equal or exceed the sum of Three Million and Fifty Two Thousand Six Hundred and Sixty-Seven Pounds (£3,052,667) then no further action on the part of the Owners shall be required
- 16.1.5 if the combined total of all such costings for Phases 1D 2 and 3 as agreed or determined are less than the sum of Three Million and Fifty Two Thousand Six Hundred and Sixty-Seven Pounds (£3,052,667) then the Owners shall apply a sum equal to half of the amount by which the costings are less than the sum of Five Million and Eighty Seven Thousand Pounds towards changing the tenure mix of one or more Alternate Tenure Affordable Units to Affordable Rented Housing Units and shall forthwith notify the District Council in writing of which Alternate Tenure Affordable Unit or units are being changed to Affordable Rented Units and shall supply full details to the District Council on receipt of a written request so to do detailing how the monies have been applied

17 AFFORDABLE HOUSING PROVIDER MORTGAGEE PROTECTION PROVISIONS

The Owners in respect of the Affordable Housing Land and the Phase 1D Affordable Housing Land hereby covenant and agree with the District Council and the District Council hereby agree as follows:

- 17.1 to take all reasonable and prudent steps to avert the repossession of any Affordable Housing Unit or Phase 1D Affordable Housing Unit by any chargee or mortgagee of the Affordable Housing Provider or the exercise by any such chargee or mortgagee of a power of sale and for these purposes in the event of default under the security or likely default to co-operate fully with the Council and the HCA to arrange a transfer of the Affordable Housing Unit or Phase 1D Affordable Housing Unit with sitting tenants to another Affordable Housing Provider or (at the Council's option) to the Council and in particular shall inform the Council immediately in the event of the Owners receiving notification from such chargee or mortgagee of any breach or alleged breach by the Affordable Housing Provider of any of its obligations under its security
- 17.2 that in the event of a default under any security referred to in paragraph 17.1 or in other circumstances warranting the intervention of the HCA or regulator of social housing (whether or not under Part 2 of the Housing and Regeneration Act 2008) nothing in this paragraph 17 shall prevent the disposal of any Affordable Housing Unit or Phase 1D Affordable Housing Unit to another Affordable Housing Provider
- 17.3 subject to and without prejudice to the powers and requirements of the HCA or any regulator of social housing under the Housing and Regeneration Act 2008 that in the

event of a default under any security referred to in paragraph 17.2 nothing in this Paragraph 17 shall prevent the disposal of any Affordable Housing Unit or Phase 1D Affordable Housing Unit by the chargee or mortgagee of an Affordable Housing Provider in the exercise of its power of sale or by any receiver appointed by such charge or mortgagee provided that the chargee or mortgagee or its receiver shall have first followed the procedure set out in Paragraph 17.4

17.4 that the procedure referred to in Paragraph 17.3 shall be as follows:

- 17.4 .1 the chargee or mortgagee or its receiver shall give not less than 6 weeks' prior notice to the Council of its intention to exercise its power of sale to enable the Council to secure the disposal of the Affordable Housing Unit or Phase 1D Affordable Housing Unit to another Registered Social Landlord or to the Council
- 17.4 .2 the Council shall then have six weeks from the notice given pursuant to Paragraph 17.4.1 within which to respond indicating that arrangements for the disposal of the Affordable Housing Unit or Phase 1D Affordable Housing Unit can be made in such a way as to safeguard the social housing character of the Affordable Housing Unit
- 17.4.3 if within the six weeks the Council does not serve its response to the notice served under paragraph 17.4.1 then the provisions of this Schedule 4 and the chargee or mortgagee or its receiver shall be entitled to exercise its power of sale free of the restrictions requiring the subject dwelling to be disposed of as an Affordable Housing Unit or Phase 1D Affordable Housing Unit
- 17.4.4 if within six weeks of the date of receipt by it of the notice served under paragraph 17.4.1 the Council serves its response indicating that arrangements can be made in accordance with paragraph 17.4.2 then the chargee or mortgagee shall so far as lawful consistent with its legal duties to its borrower co-operate with such arrangements and use its reasonable endeavours to secure such disposal
- 17.4.5 if the Council or any other person cannot within a period being the greater of (a) six weeks of the date of service of its response under paragraph 17.4.2 or (b) three months from the date of service of the notice by the chargee or mortgagee pursuant to paragraph 17.4.1 hereof secure such disposal then provided that the chargee or mortgagee shall have complied with its obligations under paragraph 17.4.4 then the chargee or mortgagee or its receiver shall be entitled to exercise its power of sale free of the restrictions in this Schedule requiring the subject dwelling to be disposed of as an Affordable Housing Unit or Phase 1D Affordable Housing Unit

17.4.6 if the chargee or mortgagee does not wish to exercise its power of sale at any time after the giving of notice under paragraph 17.4.1 or the Council does not wish to continue with the exercise of its powers under paragraph 17.4.4 after the giving of its response under paragraph 17.4.2 that party shall give to the other not less than seven days' written notice of its intention to discontinue and if the Council gives notice to discontinue the provisions of Paragraph 17.4.3 shall apply

**SCHEDULE 5
EMPLOYMENT LAND OBLIGATIONS**

Employment Land Obligations

The Owners hereby covenant and agree with the District Council :

1. To reserve and set aside the Employment Land for Employment Uses from the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course until expiry of the Marketing Period.
2. To notify the District Council of the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course.
3. Upon completion of the Link Road to the boundary of the Neighbourhood Centre to base course to implement the Marketing Strategy in relation to the Employment Land for the duration of the Marketing Period and to offer the Employment Land for sale on commercial terms at a price of Two Hundred Thousand Pounds (£200,000) per gross acre increased by the percentage increase if any in the BCIS Index between the date of its last publication prior to the date of this Deed and the date of its last publication immediately prior to exchange of contracts for the sale of the land or the relevant part of it.

**SCHEDULE 6
RETAIL RAIL AND PRIMARY CARE FACILITIES**

**PART 1
THE RETAIL FACILITIES LAND**

The Owners hereby covenant and agree with the District Council:

1. To reserve and set aside the Retail Facilities Land for retail uses within Use Classes A1 A2 A3 A4 and/or A5 from the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course until the completion of the Marketing Period
2. To notify the District Council of the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course
3. Upon completion of the Link Road to the boundary of the Neighbourhood Centre to base course to implement the Marketing Strategy in relation to the Retail Facilities Land for the duration of the Marketing Period
4. To provide the District Council on receipt of a written request so to do with such details as it may reasonably require of what steps have been taken to market to Retail Facilities Land and on what terms together with details of all responses to the Marketing Strategy

**PART 2
RESERVATION OF LAND FOR THE RAILWAY STATION AND STATION CAR PARK**

The Owners hereby covenant and agree with the District Council;

1. to reserve and set aside the Railway Station and Car Park Site for such purposes.
2. If before or after the Occupation of the 1509th Dwelling Network Rail (or any successor to its statutory functions) shall have confirmed to the Owner its intention not to proceed with the development of the Railway Station to notify the District Council in writing to that effect and produce such documentary evidence as the District Council shall reasonably require to confirm that position.
3. if the District Council acting reasonably is satisfied that Network Rail (or any successor to its statutory functions) have confirmed its intention not to proceed with the development of the Railway Station the reservation and setting aside of the land within the Development for the Railway Station and Station Car Park shall cease to apply

PROVIDED ALWAYS THAT if by the Occupation of the earlier of: the 2209th Dwelling; or the Occupation of last Dwelling to be occupied in Phase 5 Network Rail shall NOT have unequivocally confirmed its intention and taken the relevant procedural steps needed to proceed with the development of the Railway Station the reservation and setting aside of the land within the Development for the Railway Station and Station Car Park shall cease to apply

**PART 3
PRIMARY CARE CENTRE SITE**

The Owners hereby covenant and agree with the District Council;

- 1 to reserve and set aside for Uses within Use Classes D1 the Primary Care Site from the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course
- 2 to notify the District Council of from the date on which the Link Road to the boundary of the Neighbourhood Centre is constructed to base-course
- 3 to provide the District Council on receipt of a written request so to do with such details as it may reasonably require of what steps have been taken to market the Primary Care Centre Site and on what terms together with details of all responses to the Marketing Strategy

SCHEDULE 7 PUBLIC ART

The Owners hereby covenant and agree with the District Council in respect of each Phase except Phase 1D

1. Not to occupy any Dwelling within a Phase until the Public Art Specification for that Phase has been approved by the District Council in writing
2. The Public Art Specification shall include but shall not be limited to
 - the location of the Public Art within the Site and/ or within the vicinity of the Site
 - the design of the Public Art
 - details of the consultation and involvement of local community groups the District Council and individuals and other parties in the development and design of the public art to be provided
 - a management plan to secure that once constructed the Public Art is managed and maintained at zero cost to the District Council (unless it has been previously agreed that a commuted sum to maintain the Public Art shall be paid to the District Council and (if appropriate) the land on which the Public Art is located is to be transferred for the sum of £1 to the District Council by agreement.)
3. to provide the Public Art in accordance with the Public Art Specification within each Phase of the Development on the Site in such location or locations as is/are approved by the District Council prior to Occupation of the 90% of the Dwellings in that Phase unless otherwise approved in writing by the District Council
4. to notify the District Council in writing when the Public Art provided pursuant to the Public Art Specification in each Phase has been provided
5. To maintain the Public Art following its completion in accordance with the Public Art Specification pending its transfer to the District Council

**SCHEDULE 8
FORMS OF TRANSFER**

**PART 1
OPEN SPACES TRANSFER**

OPEN SPACE [WITH PAVILION]

Land Registry Transfer of part of registered title(s)

TP1

If you need more room than is provided for in a panel, and your software allows, you can expand any panel in the form. Alternatively use continuation sheet CS and attach it to this form.

Leave blank if not yet registered.

When application for registration is made these title number(s) should be entered in panel 2 of Form AP1.

Insert address, including postcode (if any), or other description of the property transferred. Any physical exclusions, such as mines and minerals, should be defined.

Place 'X' in the appropriate box and complete the statement.

For example 'edged red'.

For example 'edged and numbered 1 in blue'.

Any plan lodged must be signed by the transferor.

Give full name(s).

Complete as appropriate where the transferor is a company.

Give full name(s).

Complete as appropriate where the transferee is a company. Also, for an overseas company, unless an arrangement with Land Registry exists, lodge either a certificate in Form 7 in Schedule 3 to the Land Registration Rules 2003 or a certified copy of the constitution in English or Welsh, or other evidence permitted by rule 183 of the Land Registration Rules 2003.

1. Title number(s) out of which the property is transferred: [TBA]
2. Other title number(s) against which matters contained in this transfer are to be registered or noted, if any: [TBA]
3. Property: All those parcels of land at Kilnwood Vale, West Sussex The property is identified <input checked="" type="checkbox"/> on the attached plan and shown edged red <input type="checkbox"/> on the title plan(s) of the above titles and shown:
4. Date:
5. Transferor: [INSERT RELEVANT CREST COMPANY] <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:
6. Transferee for entry in the register: Horsham District Council <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:

Each transferee may give up to three addresses for service, one of which must be a postal address whether or not in the UK (including the postcode, if any). The others can be any combination of a postal address, a UK DX box number or an electronic address.

Place 'X' in the appropriate box. State the currency unit if other than sterling. If none of the boxes apply, insert an appropriate memorandum in panel 12.

Place 'X' in any box that applies.

Add any modifications.

Where the transferee is more than one person, place 'X' in the appropriate box.

Complete as necessary.

Use this panel for:
 - definitions of terms not defined above
 - rights granted or reserved
 - restrictive covenants
 - other covenants
 - agreements and declarations
 - any required or permitted statements
 - other agreed provisions.

The prescribed subheadings may be added to, amended, repositioned or omitted.

Any other land affected by rights granted or reserved or by restrictive covenants should be defined by reference to a plan.

<p>7. Transferee's intended address(es) for service for entry in the register:</p> <p>Park North, North Street, Horsham, West Sussex RH12 1RL</p>
<p>8. The Transferor transfers the Property to the Transferee</p>
<p>9. Consideration</p> <p><input checked="" type="checkbox"/> The transferor has received from the transferee for the property the following sum (in words and figures): £1.00 (One Pound)</p> <p><input type="checkbox"/> The transfer is not for money or anything that has a monetary value</p> <p><input type="checkbox"/> Insert other receipt as appropriate:</p>
<p>10. The transferor transfers with:</p> <p><input checked="" type="checkbox"/> full title guarantee</p> <p><input type="checkbox"/> limited title guarantee</p>
<p>11. Declaration of trust. The transferee is more than one person and:</p> <p><input type="checkbox"/> they are to hold the property on trust for themselves as joint tenants</p> <p><input type="checkbox"/> they are to hold the property on trust for themselves as tenants in common in equal shares</p> <p><input type="checkbox"/> they are to hold the property on trust:</p>
<p>12. Additional provisions</p> <p>12.1 Definitions</p> <p>12.1.1 Retained Land means all that freehold property (except the Property) now or formerly vested in the Transferor under the title number(s) at panel(s) 1 [and 2]</p> <p>12.1.2 Perpetuity Period means Twenty One Years from the date hereof</p> <p>12.1.3 Planning Permission means any outline planning permission granted pursuant to the planning application submitted to Horsham District Council under reference number [<i>main Kilnwood outline consent</i>]</p> <p>12.1.4 Reserved Matters Approval means any approval granted by Horsham District Council or the relevant secretary of state for any reserved matters application submitted pursuant to the Planning Permission</p> <p>12.1.5 Section 106 Agreement means [<i>insert details of the</i></p>

12.1.6 **Services** means hot and cold water, soil, surface water, gas, fuel, oil, electricity, telephone, telephonic signals, television, visual, audio, fax, electronic mail, data, information, communications and other services

12.1.7 **Service Media** means all or any of the sewers drains channels pipes wires and cables or similar installations now or later constructed within upon or through the Property or the Retained Land.

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

12.2 **Rights granted for the benefit of the Property**

12.2.1 A right of way on foot only in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the footpaths within the Retained Land intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted

12.2.2 A right of way on foot with or without vehicles (together with plant and machinery) in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the roads within the Retained Land intended to be adopted for public use from when those roads have been constructed until such roads shall be adopted

12.2.3 A right of support and protection from the Retained Land

12.2.4 The full and uninterrupted right pending adoption for all purposes associated with the Transferee's use of the Property to connect to and to use the Service Media which run in on over under or through the Retained Land together with the right for the Transferee on giving not less than 48 hours prior written notice (except in the case of emergency when no notice is required) to enter upon the Retained Land with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to repair or to renew, alter, maintain, inspect and remove any of the Services and/or Service Media in on over under or through the Retained Land which serve solely the Property (and to inspect, maintain, repair and where reasonably necessary renew any Services and/or Service Media which serve the Property and the Retained Land) making good all damage caused forthwith provided always that such right shall not be exercised over any land built upon or to be built upon (or forming or to form garden land within the boundaries of any building plot) pursuant to the Planning Permission or any Reserved Matters Approval nor shall such right prevent the Transferor from, upon giving to the Transferee not less than three months prior written notice, diverting Service Media serving the Property at the Transferor's cost and provided any interference to Services to the Property is

kept to a minimum level reasonably practicable

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

12.3 Rights reserved for the benefit of the Retained Land

12.3.1 A right of way on foot only in common with all others similarly entitled and all of those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any footpaths within the Property intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted

12.3.2 a right of way on foot with or without vehicles together with plant and machinery in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any roads within the Property intended to be adopted for public use from when those roads have been constructed until such roads are adopted

12.3.3 To use all Service Media laid or to be laid within the Perpetuity Period on over or through the Property for the passage and provision of Services

12.3.4 A right of support and protection from the Property

12.3.5 At all reasonable times upon giving not less than forty eight hours prior written notice (except in the case of an emergency when no notice is required) to enter upon the Property and each and every part thereof with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to lay construct inspect maintain and connect to adjust cleanse repair alter renew and remove Services and Service Media now or within the Perpetuity Period in on over under or through the Property making good all damage or disturbance forthwith which may be caused to the Property in the exercise of such right provided always that such right shall not be exercised over any land built upon or to be built upon or forming or to form car parking land pursuant to the Planning Permission or any Reserved Matters Approval

Include words of covenant.

12.4 Restrictive covenants by the Transferee

12.4.1 The Transferee covenants with the Transferor to observe and perform the restrictions contained in clause 12.4.2 ("the Restrictions") and it is hereby agreed and declared that:

(a) the benefit of this covenant shall attach to and enure for each and every part of the Retained Land

(b) only the Transferor (and not its successors unless an express deed of assignment has been entered into between the Transferor and the relevant successor) shall have the right to consent to any variation or release of any of the Restrictions (the Transferor acknowledging that the Restrictions and the covenants at clause 12.5.1 shall be null and void if the Transferor ceases to exist without first assigning the benefit of this covenant or the covenants at clause 12.5.1 (as applicable) and informing the

Transferee in writing that it has done so); and

- (c) the burden of this covenant is intended to bind and shall bind each and every part of the Property into whosoever hands it may come

12.4.2 The Restrictions are the following:

- (a) *Where this is a transfer of open space without a pavilion having been built or to be built on the Property then the following wording will apply:* Not to erect on the Property any buildings or structures except small scale structures ancillary to the use of the Property for public open space

Where this is a transfer of open space with a pavilion having been built or to be built on the Property then the following wording will apply: Not to erect on the Property any buildings or structures except a pavilion and small scale structures ancillary to the use of the Property as a pavilion and for public open space

- (b) Not to use the Property for any purpose other than as a pavilion and as public open space for recreational uses by all members of the public or for purposes reasonably and properly ancillary thereto
- (c) Not to cause or permit any building structure landscaping or works on the Property to obstruct or interfere with any sight lines or visibility splays required by the local planning or highways authorities in respect of the development of the Retained Land or with any rights or entitlements to light air and support in favour of the Retained Land
- (d) Not to cause or permit any trees or shrubs to be planted on the Property within four metres of any Services and/or Service Media or to become a danger or a nuisance to any persons or property
- (e) Not to do or permit or suffer to be done on the Property any act matter or thing which constitutes a legal nuisance

Include words of covenant.

12.5 **Further covenants by the Transferee**

12.5.1 The Transferee covenants with the Transferor (but not its successors or assigns unless the benefit of such covenants is expressly assigned by deed to a third party by the Transferor and the Transferor notifies the Transferee of such assignment in writing) that it will:-

- (a) grant any easements wayleaves and licences to any statutory undertaker or body or company providing gas electricity water sewerage drainage telecommunication systems heating or any such similar services in such form as such statutory undertaker or body or company may reasonably require for the benefit of the Retained Land except where it is unreasonable for the Transferee to do so
- (b) on receipt of a request in writing from the Transferor

promptly to enter into such access and service adoption agreements in relation to the construction layout adoption and subsequent use and maintenance of any roads sight lines Services and Service Media in so far as the same may affect the Property

- (c) comply with the provisions of the Planning Permission any Reserved Matters Approval and the Section 106 Agreement in so far as the same relate to the Property including without limitation those covenants and conditions relating to the maintenance of the Property
- (d) not transfer assign let or part with possession of the whole or any part of the Property without first requiring the transferee assignee lessee or disponee and their successors in title to enter into a deed of covenant directly with the Transferor and / or any assignee of the benefit of this covenant (of which the Transferee has written notice) in such form as the Transferor or such assignee shall reasonably require in order to ensure that all covenants obligations and restrictions of the Transferee contained in this Transfer shall be enforceable by the Transferor and its successors in title against any person in whom the Property or part thereof shall become vested
- (e) indemnify and keep indemnified the Transferor (and successors and assigns where applicable) at all times against all actions proceedings losses damages costs claims and expenses and any other liabilities resulting from any future non-observance or non-performance of any covenants contained in this Transfer and any covenants or obligations which relate to the Property contained in or referred to on the Registers of the title(s) mentioned at panel 1

12.6 **Restriction on Proprietorship Register**

12.6.1 The parties agree that the Property shall be subject to the following restriction which shall be entered in the Proprietorship Register of the Property at the Land Registry (subject to any amendments thereto required by the Land Registry):-

"No disposition of the registered estate or any part thereof by the proprietor of the registered estate or by the proprietor of any registered charge is to be registered without a certificate signed by the solicitor of the Transferor that the provisions of clause 12.5.1(d) of a transfer dated [] and made between [] have been complied with."

12.7 Other

12.7.1 Section 62 of the Law of Property Act 1925 and the rule in "Wheeldon v Burrows" do not apply to this Transfer and no legal or other rights are granted over the Retained Land for the benefit of the Property or granted over the Property for the benefit of the Retained Land by this Transfer except for those expressly granted or reserved by this Transfer

12.7.2 The benefit of any rights or covenants annexed or

Insert here any required or permitted statements, certificates or applications and any agreed declarations and so on.

otherwise attached to the Property immediately prior to the date of this Transfer shall be excluded from this Transfer and shall not be granted, transferred, assigned or included in the Transfer and this Transfer shall not be construed or operate as implying the same to the intent that neither the Transferee nor any successor in title nor any other person with an interest in the Property from time to time shall be entitled to enforce any such rights or covenants and for the avoidance of doubt the Transferor retains the exclusive benefit of and right to modify, vary, dispose or deal in any way whatsoever with any such matters

- 12.7.3 For the purposes of Section 6(2) of the Law of Property (Miscellaneous Provisions) Act 1994 all matters now recorded in registers open to public inspection are to be considered within the actual knowledge of the Transferee
- 12.7.4 The parties to this Transfer do not intend that any of its terms will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 and by any person not a party to it
- 12.7.5 The parties hereby agree and declare that in respect of any boundary identified with a "T" mark facing in to the Property on the plan the Transferee shall be liable to maintain repair or renew the same
- 12.7.6 Where a right is granted by this Transfer and expressed to subsist until adoption, at any time prior thereto the Transferor may, upon giving to the Transferee not less than three months prior written notice, alter, amend or divert the subject matter of the right at the Transferor's own cost whereupon the right shall apply to the revised route and any existing rights in respect of the former route shall be null and void provided always that any interference to the right granted is kept to the minimum level of interference reasonably practicable
- 12.7.7 This Transfer shall (unless the context requires otherwise) be interpreted as follows:
- the expression "Transferee" shall extend to its successors in title and assigns but the expression "Transferor" shall not;
- 12.7.8 words in the singular include the plural (and vice versa);
- 12.7.9 words in one gender include any other gender;
- 12.7.10 all covenants shall (where more than one person gives or becomes bound by them) be treated as joint and several;
- 12.7.11 references to doing or not permitting any act shall extend to causing or allowing or not permitting such act;
- 12.7.12 rights and easements granted to the Transferee are granted in common with the Transferor and all others having similar rights and those to whom such rights are granted;
- 12.7.13 references to the Property and the Retained Land shall

be deemed to be references to each and every part and the whole or any part thereof;

12.7.14 a reference to a person or to a third party includes a body corporate, individual, partnership, limited liability partnership or unincorporated association

The transferor must execute this transfer as a deed using the space opposite. If there is more than one transferor, all must execute. Forms of execution are given in Schedule 9 to the Land Registration Rules 2003. If the transfer contains transferee's covenants or declarations or contains an application by the transferee (such as for a restriction), it must also be executed by the transferee.

13. Execution

Signed as a deed by
[Name]
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Signed as a deed by
[Name of Company] [CREST]
acting by [a director and
its secretary] [two
directors]

Signature of Director

Signature of Director/Secretary

[OR]

Signed as a deed by
[Name of Company] [CREST]
acting by a director
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Executed as a deed by
affixing the Common Seal of
HORSHAM DISTRICT COUNCIL
in the presence of:

Authorised Signatory _____

WARNING

If you dishonestly enter information or make a statement that you know is, or might be, untrue or misleading, and intend by doing so to make a gain for yourself or another person, or to cause loss or the risk of loss to another person, you may commit the offence of fraud under section 1 of the Fraud Act 2006, the maximum penalty for which is 10 years' imprisonment or an unlimited fine, or both.

Failure to complete this form with proper care may result in a loss of protection under the Land Registration Act 2002 if, as a result, a mistake is made in the register.

Under section 66 of the Land Registration Act 2002 most documents (including this form) kept by the registrar relating to an application to the registrar or referred to in the register are open to public inspection and copying. If you believe a document contains prejudicial information, you may apply for that part of the document to be made exempt using Form EX1, under rule 136 of the Land Registration Rules 2003.

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SCHEDULE 8

**PART 2
SUDS TRANSFER**

OPEN SPACE [SUDS]

Land Registry Transfer of part of registered title(s)

TP1

If you need more room than is provided for in a panel, and your software allows, you can expand any panel in the form. Alternatively use continuation sheet CS and attach it to this form.

Leave blank if not yet registered.

When application for registration is made these title number(s) should be entered in panel 2 of Form AP1.

Insert address, including postcode (if any), or other description of the property transferred. Any physical exclusions, such as mines and minerals, should be defined.

Place 'X' in the appropriate box and complete the statement.

For example 'edged red'.

For example 'edged and numbered 1 in blue'.

Any plan lodged must be signed by the transferor.

Give full name(s).

Complete as appropriate where the transferor is a company.

Give full name(s).

Complete as appropriate where the transferee is a company. Also, for an overseas company, unless an arrangement with Land Registry exists, lodge either a certificate in Form 7 in Schedule 3 to the Land Registration Rules 2003 or a certified copy of the constitution in English or Welsh, or other evidence permitted by rule 183 of the Land Registration Rules 2003.

1. Title number(s) out of which the property is transferred: [TBA]
2. Other title number(s) against which matters contained in this transfer are to be registered or noted, if any: [TBA]
3. Property: All those parcels of land at Kilnwood Vale, West Sussex The property is identified <input checked="" type="checkbox"/> on the attached plan and shown edged red <input type="checkbox"/> on the title plan(s) of the above titles and shown:
4. Date:
5. Transferor: [INSERT RELEVANT CREST COMPANY] <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:
6. Transferee for entry in the register: Horsham District Council <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:

Each transferee may give up to three addresses for service, one of which must be a postal address whether or not in the UK (including the postcode, if any). The others can be any combination of a postal address, a UK DX box number or an electronic address.

Place 'X' in the appropriate box. State the currency unit if other than sterling. If none of the boxes apply, insert an appropriate memorandum in panel 12.

Place 'X' in any box that applies.

Add any modifications.

Where the transferee is more than one person, place 'X' in the appropriate box.

Complete as necessary.

Use this panel for:
- definitions of terms not defined above
- rights granted or reserved
- restrictive covenants
- other covenants
- agreements and declarations
- any required or permitted statements
- other agreed provisions.

The prescribed subheadings may be added to, amended, repositioned or omitted.

Any other land affected by rights granted or reserved or by restrictive covenants should be defined by reference to a plan.

7. Transferee's intended address(es) for service for entry in the register:

Park North, North Street, Horsham, West Sussex RH12 1RL

8. The Transferor transfers the Property to the Transferee

9. Consideration

The transferor has received from the transferee for the property the following sum (in words and figures):
£1.00 (One Pound)

The transfer is not for money or anything that has a monetary value

Insert other receipt as appropriate:

10. The transferor transfers with:

full title guarantee

limited title guarantee

11. Declaration of trust. The transferee is more than one person and:

they are to hold the property on trust for themselves as joint tenants

they are to hold the property on trust for themselves as tenants in common in equal shares

they are to hold the property on trust:

12. Additional provisions

12.1 **Definitions**

12.1.1 **Retained Land** means all that freehold property (except the Property) now or formerly vested in the Transferor under the title number(s) at panel(s) 1 [and 2]

12.1.2 **Perpetuity Period** means Twenty One Years from the date hereof

12.1.3 **Planning Permission** means any outline planning permission granted pursuant to the planning application submitted to Horsham District Council under reference number [*main Kilnwood outline consent*]

12.1.4 **Reserved Matters Approval** means any approval granted by Horsham District Council or the relevant secretary of state for any reserved matters application submitted pursuant to the Planning Permission

12.1.5 **Section 106 Agreement** means [*insert details of the*

12.1.6 **Services** means hot and cold water, soil, surface water, gas, fuel, oil, electricity, telephone, telephonic signals, television, visual, audio, fax, electronic mail, data, information, communications and other services

12.1.7 **Service Media** means all or any of the sewers drains channels watercourses rivers rhynes pipes wires cables lakes ponds and other surface water attenuation features) or any similar features or installations now or later constructed within upon or through the Property or the Retained Land.

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

12.2 **Rights granted for the benefit of the Property**

12.2.1 A right of way on foot only in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the footpaths within the Retained Land intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted

12.2.2 A right of way on foot with or without vehicles (together with plant and machinery) in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the roads within the Retained Land intended to be adopted for public use from when those roads have been constructed until such roads shall be adopted

12.2.3 A right of support and protection from the Retained Land

12.2.4 The full and uninterrupted right pending adoption for all purposes associated with the Transferee's use of the Property to connect to and to use the Service Media which run in on over under or through the Retained Land together with the right for the Transferee on giving not less than 48 hours prior written notice (except in the case of emergency when no notice is required) to enter upon the Retained Land with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to repair or to renew, alter, maintain, inspect and remove any of the Services and/or Service Media in on over under or through the Retained Land which serve solely the Property (and to inspect, maintain, repair and where reasonably necessary renew any Services and/or Service Media which serve the Property and the Retained Land) making good all damage caused forthwith provided always that such right shall not be exercised over any land built upon or to be built upon (or forming or to form garden land within the boundaries of any building plot) pursuant to the Planning Permission or any Reserved Matters Approval nor shall such right prevent the Transferor from, upon giving to the Transferee not less than three months prior written notice, diverting Service Media serving the Property at the Transferor's cost and

provided any interference to Services to the Property is kept to a minimum level reasonably practicable

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

- 12.3 **Rights reserved for the benefit of the Retained Land**
- 12.3.1 A right of way on foot only in common with all others similarly entitled and all of those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any footpaths within the Property intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted
- 12.3.2 A right of way on foot with or without vehicles together with plant and machinery in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any roads within the Property intended to be adopted for public use from when those roads have been constructed until such roads are adopted
- 12.3.3 A right to use all Service Media laid or to be laid or constructed or to be constructed within the Perpetuity Period in on over under or through the Property for the passage and provision of Services
- 12.3.4 A right of support and protection from the Property
- 12.3.5 At all reasonable times upon giving not less than forty eight hours prior written notice (except in the case of an emergency when no notice is required) to enter upon the Property and each and every part thereof with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to lay construct inspect maintain and connect to adjust cleanse repair alter renew and remove Services and Service Media now or within the Perpetuity Period in on over under or through the Property making good all damage or disturbance forthwith which may be caused to the Property in the exercise of such right provided always that such right shall not be exercised over any land built upon or to be built upon or forming or to form car parking land pursuant to the Planning Permission or any Reserved Matters Approval

Include words of covenant.

- 12.4 **Restrictive covenants by the Transferee**
- 12.4.1 The Transferee covenants with the Transferor to observe and perform the restrictions contained in clause 12.4.2 ("the **Restrictions**") and it is hereby agreed and declared that:
- (a) the benefit of this covenant shall attach to and enure for each and every part of the Retained Land
- (b) only the Transferor (and not its successors unless an express deed of assignment has been entered into between the Transferor and the relevant successor) shall have the right to consent to any variation or release of any of the Restrictions (the Transferor acknowledging that the Restrictions and the covenants at clause 12.5.1 shall be null and void if the Transferor ceases to exist without first assigning the benefit of this covenant or the covenants at

clause 12.5.1 (as applicable) and informing the Transferee in writing that it has done so); and

- (c) the burden of this covenant is intended to bind and shall bind each and every part of the Property into whosoever hands it may come

12.4.2 The Restrictions are the following:

- (a) Not to erect on the Property any buildings or structures except small scale structures ancillary to the use of the Property for the provision of a sustainable urban drainage scheme serving the development of which the Property forms part
- (b) Not to use the Property for any purpose other than for the provision of a sustainable urban drainage scheme serving the development of which the Property forms part provided that where any part of the Property comprises land which is not intended to form part of a lake, balancing pond or other surface water retention or transmission feature and any ancillary equipment then not to use such land other than as public open space for recreational uses by all members of the public
- (c) Not to cause or permit any building structure landscaping or works on the Property to obstruct or interfere with any sight lines or visibility splays required by the local planning or highways authorities in respect of the development of the Retained Land or with the use of the property as an integral part of a sustainable urban drainage scheme or with any rights or entitlements to light air and support in favour of the Retained Land
- (d) Not to cause or permit any trees or shrubs to be planted on the Property within four metres of any Services and/or Service Media or such that they may impede or otherwise inhibit or conflict with the use of the Property for the provision of a sustainable urban drainage scheme serving the development of which the Property forms part or so as to become a danger or a nuisance to any persons or property
- (e) Not to do or permit or suffer to be done on the Property any act matter or thing which constitutes a legal nuisance

12.5 Further covenants by the Transferee

12.5.1 The Transferee covenants with the Transferor (but not its successors or assigns unless the benefit of such covenants is expressly assigned by deed to a third party by the Transferor and the Transferor notifies the Transferee of such assignment in writing) that it will:-

- (a) grant any easements wayleaves and licences to any statutory undertaker or body or company providing gas electricity water sewerage drainage telecommunication systems heating or any such similar services in such form as such statutory undertaker or body or company may reasonably require for the benefit of the Retained Land except where it is unreasonable for the Transferee to do so
- (b) on receipt of a request in writing from the Transferor promptly to enter into such access and service adoption agreements in relation to the construction layout adoption and subsequent use and maintenance of any roads sight lines Services and Service Media in so far as the same may affect the Property
- (c) comply with the provisions of the Planning Permission any Reserved Matters Approval and the Section 106 Agreement in so far as the same relate to the Property including without limitation those covenants and conditions relating to the maintenance of the Property
- (d) not transfer assign let or part with possession of the whole or any part of the Property without first requiring the transferee assignee lessee or disponee and their successors in title to enter into a deed of covenant directly with the Transferor and / or any assignee of the benefit of this covenant (of which the Transferee has written notice) in such form as the Transferor or such assignee shall reasonably require in order to ensure that all covenants obligations and restrictions of the Transferee contained in this Transfer shall be enforceable by the Transferor and its successors in title against any person in whom the Property or part thereof shall become vested
- (e) indemnify and keep indemnified the Transferor (and successors and assigns where applicable) at all times against all actions proceedings losses damages costs claims and expenses and any other liabilities resulting from any future non-observance or non-performance of any covenants contained in this Transfer and any covenants or obligations which relate to the Property contained in or referred to on the Registers of the title(s) mentioned at panel 1
- (f) maintain all surface water drainage infrastructure so that it performs at all times in line with the drainage parameters for which it was designed

12.6 Restriction on Proprietorship Register

12.6.1 The parties agree that the Property shall be subject to the following restriction which shall be entered in the Proprietorship Register of the Property at the Land

Registry (subject to any amendments thereto required by the Land Registry):-

"No disposition of the registered estate or any part thereof by the proprietor of the registered estate or by the proprietor of any registered charge is to be registered without a certificate signed by the solicitor of the Transferor that the provisions of clause 12.5.1(d) of a transfer dated [] and made between [] have been complied with."

Insert here any required or permitted statements, certificates or applications and any agreed declarations and so on.

12.7 Other

12.7.1 Section 62 of the Law of Property Act 1925 and the rule in "Wheeldon v Burrows" do not apply to this Transfer and no legal or other rights are granted over the Retained Land for the benefit of the Property or granted over the Property for the benefit of the Retained Land by this Transfer except for those expressly granted or reserved by this Transfer

12.7.2 The benefit of any rights or covenants annexed or otherwise attached to the Property immediately prior to the date of this Transfer shall be excluded from this Transfer and shall not be granted, transferred, assigned or included in the Transfer and this Transfer shall not be construed or operate as implying the same to the intent that neither the Transferee nor any successor in title nor any other person with an interest in the Property from time to time shall be entitled to enforce any such rights or covenants and for the avoidance of doubt the Transferor retains the exclusive benefit of and right to modify, vary, dispose or deal in any way whatsoever with any such matters

12.7.3 For the purposes of Section 6(2) of the Law of Property (Miscellaneous Provisions) Act 1994 all matters now recorded in registers open to public inspection are to be considered within the actual knowledge of the Transferee

12.7.4 The parties to this Transfer do not intend that any of its terms will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 and by any person not a party to it

12.7.5 The parties hereby agree and declare that in respect of any boundary identified with a "T" mark facing in to the Property on the plan the Transferee shall be liable to maintain repair or renew the same

12.7.6 Where a right is granted by this Transfer and expressed to subsist until adoption, at any time prior thereto the Transferor may, upon giving to the Transferee not less than three months prior written notice, alter, amend or divert the subject matter of the right at the Transferor's

own cost whereupon the right shall apply to the revised route and any existing rights in respect of the former route shall be null and void provided always that any interference to the right granted is kept to the minimum level of interference reasonably practicable

12.7.7 This Transfer shall (unless the context requires otherwise) be interpreted as follows:

the expression "Transferee" shall extend to its successors in title and assigns but the expression "Transferor" shall not;

12.7.8 words in the singular include the plural (and vice versa);

12.7.9 words in one gender include any other gender;

12.7.10 all covenants shall (where more than one person gives or becomes bound by them) be treated as joint and several;

12.7.11 references to doing or not permitting any act shall extend to causing or allowing or not permitting such act;

12.7.12 rights and easements granted to the Transferee are granted in common with the Transferor and all others having similar rights and those to whom such rights are granted;

12.7.13 references to the Property and the Retained Land shall be deemed to be references to each and every part and the whole or any part thereof;

12.7.14 a reference to a person or to a third party includes a body corporate, individual, partnership, limited liability partnership or unincorporated association

The transferor must execute this transfer as a deed using the space opposite. If there is more than one transferor, all must execute. Forms of execution are given in Schedule 9 to the Land Registration Rules 2003. If the transfer contains transferee's covenants or declarations or contains an application by the transferee (such as for a restriction), it must also be executed by the transferee.

13. Execution

Signed as a deed by
[Name]
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Signed as a deed by
[Name of Company] [CREST]
acting by [a director and
its secretary] [two
directors]

Signature of Director

Signature of Director/Secretary

[OR]

Signed as a deed by
[Name of Company] [CREST]
acting by a director
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Executed as a deed by
affixing the Common Seal of
HORSHAM DISTRICT COUNCIL
in the presence of:

Authorised Signatory _____

WARNING

If you dishonestly enter information or make a statement that you know is, or might be, untrue or misleading, and intend by doing so to make a gain for yourself or another person, or to cause loss or the risk of loss to another person, you may commit the offence of fraud under section 1 of the Fraud Act 2006, the maximum penalty for which is 10 years' imprisonment or an unlimited fine, or both.

Failure to complete this form with proper care may result in a loss of protection under the Land Registration Act 2002 if, as a result, a mistake is made in the register.

Under section 66 of the Land Registration Act 2002 most documents (including this form) kept by the registrar relating to an application to the registrar or referred to in the register are open to public inspection and copying. If you believe a document contains prejudicial information, you may apply for that part of the document to be made exempt using Form EX1, under rule 136 of the Land Registration Rules 2003.

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SCHEDULE 8

**PART 3
COMMUNITY BUILDING TRANSFER**

COMMUNITY FACILITIES BUILDING

Land Registry Transfer of part of registered title(s)

TP1

If you need more room than is provided for in a panel, and your software allows, you can expand any panel in the form. Alternatively use continuation sheet CS and attach it to this form.

Leave blank if not yet registered.

When application for registration is made these title number(s) should be entered in panel 2 of Form AP1.

Insert address, including postcode (if any), or other description of the property transferred. Any physical exclusions, such as mines and minerals, should be defined.

Place 'X' in the appropriate box and complete the statement.

For example 'edged red'.

For example 'edged and numbered 1 in blue'.

Any plan lodged must be signed by the transferor.

Give full name(s).

Complete as appropriate where the transferor is a company.

Give full name(s).

Complete as appropriate where the transferee is a company. Also, for an overseas company, unless an arrangement with Land Registry exists, lodge either a certificate in Form 7 in Schedule 3 to the Land Registration Rules 2003 or a certified copy of the constitution in English or Welsh, or other evidence permitted by rule 183 of the Land Registration Rules 2003.

1. Title number(s) out of which the property is transferred: [TBA]
2. Other title number(s) against which matters contained in this transfer are to be registered or noted, if any: [TBA]
3. Property: All those parcels of land at Kilnwood Vale, West Sussex The property is identified <input checked="" type="checkbox"/> on the attached plan and shown edged red <input type="checkbox"/> on the title plan(s) of the above titles and shown:
4. Date:
5. Transferor: [INSERT RELEVANT CREST COMPANY] <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:
6. Transferee for entry in the register: Horsham District Council <u>For UK incorporated companies/LLPs</u> Registered number of company or limited liability partnership including any prefix: <u>For overseas companies</u> (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:

Each transferee may give up to three addresses for service, one of which must be a postal address whether or not in the UK (including the postcode, if any). The others can be any combination of a postal address, a UK DX box number or an electronic address.

7. Transferee's intended address(es) for service for entry in the register:

Park North, North Street, Horsham, West Sussex RH12 1RL

8. The Transferor transfers the Property to the Transferee

Place 'X' in the appropriate box. State the currency unit if other than sterling. If none of the boxes apply, insert an appropriate memorandum in panel 12.

9. Consideration

The transferor has received from the transferee for the property the following sum (in words and figures):
£1.00 (One Pound)

The transfer is not for money or anything that has a monetary value

Insert other receipt as appropriate:

Place 'X' in any box that applies.

Add any modifications.

10. The transferor transfers with:

full title guarantee

limited title guarantee

Where the transferee is more than one person, place 'X' in the appropriate box.

11. Declaration of trust. The transferee is more than one person and:

they are to hold the property on trust for themselves as joint tenants

they are to hold the property on trust for themselves as tenants in common in equal shares

they are to hold the property on trust:

Complete as necessary.

Use this panel for:

- definitions of terms not defined above
- rights granted or reserved
- restrictive covenants
- other covenants
- agreements and declarations
- any required or permitted statements
- other agreed provisions.

The prescribed subheadings may be added to, amended, repositioned or omitted.

Any other land affected by rights granted or reserved or by restrictive covenants should be defined by reference to a plan.

12. Additional provisions

12.1 **Definitions**

12.1.1 **Retained Land** means all that freehold property (except the Property) now or formerly vested in the Transferor under the title number(s) at panel(s) 1 [and 2]

12.1.2 **Perpetuity Period** means Twenty One Years from the date hereof

12.1.3 **Planning Permission** means any outline planning permission granted pursuant to the planning application submitted to Horsham District Council under reference number [*main Kilnwood outline consent*]

12.1.4 **Reserved Matters Approval** means any approval granted by Horsham District Council or the relevant secretary of state for any reserved matters application submitted pursuant to the Planning Permission

12.1.5 **Section 106 Agreement** means [*insert details of the*

- 12.1.6 **Services** means hot and cold water, soil, surface water, gas, fuel, oil, electricity, telephone, telephonic signals, television, visual, audio, fax, electronic mail, data, information, communications and other services
- 12.1.7 **Service Media** means all or any of the sewers drains channels pipes wires and cables or similar installations now or later constructed within upon or through the Property or the Retained Land.

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

12.2 **Rights granted for the benefit of the Property**

- 12.2.1 A right of way on foot only in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the footpaths within the Retained Land intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted
- 12.2.2 A right of way on foot with or without vehicles (together with plant and machinery) in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferee's use of the Property over the roads within the Retained Land intended to be adopted for public use from when those roads have been constructed until such roads shall be adopted
- 12.2.3 A right of support and protection from the Retained Land
- 12.2.4 The full and uninterrupted right pending adoption for all purposes associated with the Transferee's use of the Property to connect to and to use the Service Media which run in on over under or through the Retained Land together with the right for the Transferee on giving not less than 48 hours prior written notice (except in the case of emergency when no notice is required) to enter upon the Retained Land with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to repair or to renew, alter, maintain, inspect and remove any of the Services and/or Service Media in on over under or through the Retained Land which serve the Property (and to inspect, maintain, repair and where reasonably necessary renew any Services and/or Service Media which serve the Property and the Retained Land) making good all damage caused forthwith provided always that such right shall not be exercised over any land built upon or to be built upon (or forming or to form garden land within the boundaries of any building plot) pursuant to the Planning Permission or any Reserved Matters Approval nor shall such right prevent the Transferor from, upon giving to the Transferee not less than three months prior written notice, diverting Service Media serving the Property at the Transferor's cost and provided any interference to Services to the Property is

kept to a minimum level reasonably practicable

Any other land affected should be defined by reference to a plan and the title numbers referred to in panel 2.

12.3 **Rights reserved for the benefit of the Retained Land**

12.3.1 A right of way on foot only in common with all others similarly entitled and all of those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any footpaths within the Property intended to be adopted for public use from when those footpaths have been constructed until such footpaths shall be adopted

12.3.2 a right of way on foot with or without vehicles together with plant and machinery in common with all others similarly entitled and all those authorised by them for all purposes associated with the Transferor's use of the Retained Land over any roads within the Property intended to be adopted for public use from when those roads have been constructed until such roads are adopted

12.3.3 To use all Service Media laid or to be laid within the Perpetuity Period on over or through the Property for the passage and provision of Services

12.3.4 A right of support and protection from the Property

12.3.5 At all reasonable times upon giving not less than forty eight hours prior written notice (except in the case of an emergency when no notice is required) to enter upon the Property and each and every part thereof with or without vehicles and with such workmen tools appliances and other equipment as may be necessary to lay construct inspect maintain and connect to adjust cleanse repair alter renew and remove Services and Service Media now or within the Perpetuity Period in on over under or through the Property making good all damage or disturbance forthwith which may be caused to the Property in the exercise of such right provided always that such right shall not be exercised over any land built upon or to be built upon or forming or to form garden land or car parking land pursuant to the Planning Permission or any Reserved Matters Approval

Include words of covenant.

12.4 **Restrictive covenants by the Transferee**

12.4.1 The Transferee covenants with the Transferor to observe and perform the restrictions contained in clause 12.4.2 ("the **Restrictions**") and it is hereby agreed and declared that:

(a) the benefit of this covenant shall attach to and enure for each and every part of the Retained Land

(b) only the Transferor (and not its successors unless an express deed of assignment has been entered into between the Transferor and the relevant successor) shall have the right to consent to any variation or release of any of the Restrictions (the Transferor acknowledging that the Restrictions and the covenants at clause 12.5.1 shall be null and void if the Transferor ceases to exist without first assigning the benefit of this covenant or the covenants at clause 12.5.1 (as applicable) and informing the

Transferee in writing that it has done so); and

- (c) the burden of this covenant is intended to bind and shall bind each and every part of the Property into whosoever hands it may come

12.4.2 The Restrictions are the following:

- (a) Not to erect on the Property any buildings or structures other than a community facilities building together with any associated ancillary structures car parking and the provision of recycling facilities if appropriate
- (b) Not to use the Property for any purpose other than for the provision of community facilities
- (c) Not to cause or permit any building structure landscaping or works on the Property to obstruct or interfere with any sight lines or visibility splays required by the local planning or highways authorities in respect of the development of the Retained Land or with any rights or entitlements to light air and support in favour of the Retained Land
- (d) Not to cause or permit any trees or shrubs to be planted on the Property within four metres of any Services and/or Service Media or to become a danger or a nuisance to any persons or property
- (e) Not to do or permit or suffer to be done on the Property any act matter or thing which constitutes a legal nuisance

Include words of covenant.

12.5 **Further covenants by the Transferee**

12.5.1 The Transferee covenants with the Transferor (but not its successors or assigns unless the benefit of such covenants is expressly assigned by deed to a third party by the Transferor and the Transferor notifies the Transferee of such assignment in writing) that it will:-

- (a) grant any easements wayleaves and licences to any statutory undertaker or body or company providing gas electricity water sewerage drainage telecommunication systems heating or any such similar services in such form as such statutory undertaker or body or company may reasonably require for the benefit of the Retained Land except where it is unreasonable for the Transferee to do so
- (b) on receipt of a request in writing from the Transferor promptly to enter into such access and service adoption agreements in relation to the construction layout adoption and subsequent use and maintenance of any roads sight lines Services and Service Media in so far as the same may affect the Property
- (c) comply with the provisions of the Planning Permission any Reserved Matters Approval and the Section 106 Agreement in so far as the same relate to the Property including without limitation those covenants and

conditions relating to the maintenance of the Property

- (d) not transfer assign let or part with possession of the whole or any part of the Property without first requiring the transferee assignee lessee or disponee and their successors in title to enter into a deed of covenant directly with the Transferor and / or any assignee of the benefit of this covenant (of which the Transferee has written notice) in such form as the Transferor or such assignee shall reasonably require in order to ensure that all covenants obligations and restrictions of the Transferee contained in this Transfer shall be enforceable by the Transferor and its successors in title against any person in whom the Property or part thereof shall become vested
- (e) indemnify and keep indemnified the Transferor (and successors and assigns where applicable) at all times against all actions proceedings losses damages costs claims and expenses and any other liabilities resulting from any future non-observance or non-performance of any covenants contained in this Transfer and any covenants or obligations which relate to the Property contained in or referred to on the Registers of the title(s) mentioned at panel 1

12.6 Restriction on Proprietorship Register

12.6.1 The parties agree that the Property shall be subject to the following restriction which shall be entered in the Proprietorship Register of the Property at the Land Registry (subject to any amendments thereto required by the Land Registry):-

"No disposition of the registered estate or any part thereof by the proprietor of the registered estate or by the proprietor of any registered charge is to be registered without a certificate signed by the solicitor of the Transferor that the provisions of clause 12.5.1(d) of a transfer dated [] and made between [] have been complied with."

Insert here any required or permitted statements, certificates or applications and any agreed declarations and so on.

12.7 Other

12.7.1 Section 62 of the Law of Property Act 1925 and the rule in "Wheeldon v Burrows" do not apply to this Transfer and no legal or other rights are granted over the Retained Land for the benefit of the Property or granted over the Property for the benefit of the Retained Land by this Transfer except for those expressly granted or reserved by this Transfer

12.7.2 The benefit of any rights or covenants annexed or otherwise attached to the Property immediately prior to the date of this Transfer shall be excluded from this Transfer and shall not be granted, transferred, assigned or included in the Transfer and this Transfer shall not be construed or operate as implying the same to the intent that neither the Transferee nor any successor in title nor any other person with an interest in the Property from time to time shall be entitled to enforce any such rights or covenants and for the avoidance of doubt the Transferor retains the exclusive

- benefit of and right to modify, vary, dispose or deal in any way whatsoever with any such matters
- 12.7.3 For the purposes of Section 6(2) of the Law of Property (Miscellaneous Provisions) Act 1994 all matters now recorded in registers open to public inspection are to be considered within the actual knowledge of the Transferee
- 12.7.4 The parties to this Transfer do not intend that any of its terms will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 and by any person not a party to it
- 12.7.5 The parties hereby agree and declare that in respect of any boundary identified with a "T" mark facing in to the Property on the plan the Transferee shall be liable to maintain repair or renew the same
- 12.7.6 Where a right is granted by this Transfer and expressed to subsist until adoption, at any time prior thereto the Transferor may, upon giving to the Transferee not less than three months prior written notice, alter, amend or divert the subject matter of the right at the Transferor's own cost whereupon the right shall apply to the revised route and any existing rights in respect of the former route shall be null and void provided always that any interference to the right granted is kept to the minimum level of interference reasonably practicable
- 12.7.7 This Transfer shall (unless the context requires otherwise) be interpreted as follows:
- the expression "Transferee" shall extend to its successors in title and assigns but the expression "Transferor" shall not;
- 12.7.8 words in the singular include the plural (and vice versa);
- 12.7.9 words in one gender include any other gender;
- 12.7.10 all covenants shall (where more than one person gives or becomes bound by them) be treated as joint and several;
- 12.7.11 references to doing or not permitting any act shall extend to causing or allowing or not permitting such act;
- 12.7.12 rights and easements granted to the Transferee are granted in common with the Transferor and all others having similar rights and those to whom such rights are granted;
- 12.7.13 references to the Property and the Retained Land shall be deemed to be references to each and every part and the whole or any part thereof;
- 12.7.14 a reference to a person or to a third party includes a body corporate, individual, partnership, limited liability partnership or unincorporated association

The transferor must execute this transfer as a deed using the space opposite. If there is more than one transferor, all must execute. Forms of execution are given in Schedule 9 to the Land Registration Rules 2003. If the transfer contains transferee's covenants or declarations or contains an application by the transferee (such as for a restriction), it must also be executed by the transferee.

13. Execution

Signed as a deed by
[Name]
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Signed as a deed by
[Name of Company] [CREST]
acting by [a director and
its secretary] [two
directors]

Signature of Director

Signature of Director/Secretary

[OR]

Signed as a deed by
[Name of Company] [CREST]
acting by a director
in the presence of:

Signature of witness: _____

Name (in BLOCK CAPITALS) _____

Address: _____

Executed as a deed by
affixing the Common Seal of
HORSHAM DISTRICT COUNCIL
in the presence of:

Authorised Signatory _____

WARNING

If you dishonestly enter information or make a statement that you know is, or might be, untrue or misleading, and intend by doing so to make a gain for yourself or another person, or to cause loss or the risk of loss to another person, you may commit the offence of fraud under section 1 of the Fraud Act 2006, the maximum penalty for which is 10 years' imprisonment or an unlimited fine, or both.

Failure to complete this form with proper care may result in a loss of protection under the Land Registration Act 2002 if, as a result, a mistake is made in the register.

Under section 66 of the Land Registration Act 2002 most documents (including this form) kept by the registrar relating to an application to the registrar or referred to in the register are open to public inspection and copying. If you believe a document contains prejudicial information, you may apply for that part of the document to be made exempt using Form EX1, under rule 136 of the Land Registration Rules 2003.

**SCHEDULE 9
MARKETING STRATEGY**

For the Employment Land - and the Retail Facilities Site

The marketing strategy will constitute:

1. the Identification of land
2. the Appointment of reputable agent
3. Mail shots by reputable agent
4. Regular Advertisements in trade and local press
5. Marketing boards on site (subject to any necessary consents required)
6. Liaison with District and County Council's economic development officers; or
7. Such alternative marketing measures as shall be reasonably agreed between the parties

**SCHEDULE 10
AFFORDABLE HOUSING UNIT PRICE**

Affordable Rented Housing Units **Required Price or Premium (including land) for sale or leasehold disposal of completed Affordable Housing Units to Affordable Housing Provider**

1 bedroom flat	60% Of Open Market Value
2 bedroom flat	60% Of Open Market Value
2 Bedroom House	60% Of Open Market Value
3 bedroom house	60% Of Open Market Value
4 bedroom house	60% Of Open Market Value

Shared Ownership /Intermediate Unit) and Alternate Tenure Affordable Units **Required Price or Premium (including land) for sale or leasehold disposal of completed Affordable Housing Units to Affordable Housing Provider**

1 bedroom flat	75% of Open Market Value
2 bedroom flat	75% of Open Market Value
2 bedroom house	75% of Open Market Value
3 bedroom house	75% of Open Market Value
4 bedroom house	75% of Open Market Value

**SCHEDULE 11
REMEDATION WORKS COSTS**

**EXTRACTS FROM TABLE 5 OF MESSRS TURNER MORUM'S VIABILITY
ASSESSMENT DATED 9 SEPTEMBER 2010 RELATING TO PHASES 1D 2 AND 3**

BEWBUSH, CRAWLEY**INFRASTRUCTURE & S.106 CONTRIBUTIONS**

	Phase 2	Phase 3	South Total
Units	605	520	1125
Net Residential Acres	33.80	31.00	64.80
Commercial Acres	3.50	1.20	4.70
Retail	5.00	0.00	5.00
Total	42.30	32.20	74.50
<u>Earth Movement & Landfill Remediation</u>			
Earth Movement	£ 1,485,000		£ 1,485,000
Earthworks Ancillaries	£ 1,069,202		£ 1,069,202
Remediation / Excavation & Disposal Off-Site	£ 97,500		£ 97,500
Gabion Revetment Works	£ 120,000		£ 120,000
General Site Clearance to Developmnt Area	£ 75,600		£ 75,600
Removal of Knotweed (Allowance)	£ 60,000		£ 60,000
Contingency @ 5%	£ 145,365		£ 145,365
Total Remediation Works	£ 3,052,667	£ -	£ 3,052,667
<u>INFRASTRUCTURE</u>			
<u>Foundation Improvements & Gas Protection Measures</u>			
Ground Improvement - Highways, Squares & open Spaces	£ 784,800	£ 674,540	£ 1,459,340
Extra Over Foundation & Gas Protection Costs to Waste Exempt Area	£ 2,252,155	£ 1,935,737	£ 4,187,892
Extra Over Foundation & Gas Protection Costs to Former Landfill Site	£ 450,532	£ 387,234	£ 837,766
Gas Protection Measure - General (Rest of Development)	£ 189,082	£ 162,518	£ 351,600
Extra Over Foundations - General (Rest of Development)			

SCHEDULE 12
MODEL FORM OF NOMINATIONS AGREEMENT (AFFORDABLE RENTED UNITS)

DATED 2016

and

HORSHAM DISTRICT COUNCIL

DEED OF NOMINATION

for

XX Affordable Rented Units

at

West Sussex

Paul Cummins
Head of Legal and Democratic Services
Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL
DX 57609 HORSHAM 6

Ref:

THIS DEED OF NOMINATION RIGHTS is made the day of 2016

BETWEEN:

(1) ("the REGISTERED PROVIDER") and

(2) **HORSHAM DISTRICT COUNCIL** of Parkside, Chart Way, Horsham West Sussex RH12 1RL
("the Council")

1. Definitions

In this Deed the following expressions shall have the following meanings:

1.1 **"Exempted Void"** means a Void which has occurred as a result of the Council transferring the previous tenant to more suitable accommodation to meet that tenant's needs

1.2 **"HCA"** means the Homes and Communities Agency (or any successor organisation or body, as the case may be)

1.3 **"Initial Let"** means the first tenancy or lease of a newly constructed and previously unoccupied Unit

1.4 **"Local Connection"** means in relation to an individual

1.4.1 such individual

1.4.1.1 immediately before taking up occupation of a Unit had his only or principal home in the (parish of) (district of ()) for a continuous period of not less than two years

1.4.1.2 a member of his household has a parent adult child brother or sister whose only or principal home is and has been for a

continuous period of not less than two years in the ()
and he wishes to be near that relative or

1.4.1.3 is and has been permanently employed in the () for a
continuous period of not less than three years

Or such other person as may be approved by the Council
and is registered on the Council's housing waiting list.

- 1.5 **"Nominee"** means a person who referred by the Council who satisfies the Local Connection and is considered by the Council as being suitable for taking a Tenancy Agreement of a Rented Unit taking into account any restrictions on occupancy set out in the S106 Agreement and **"Nominees"** shall be construed accordingly
- 1.6 **"Planning Permission"** means the permission issued by the Council as local planning authority under reference DC/XX/XXXX
- 1.7 **"Registered Provider"** as defined in the Housing & Regeneration Act 2008
- 1.8 **"Rented Units"** means () constructed upon the Site each of which is to be offered under a Tenancy Agreement
- 1.9 **"S106 Agreement"** means the agreement relating to the Site and dated () and made between (1) (2) Horsham District Council and any subsequent supplemental agreements varying it thereafter
- 1.10 **"Site"** means the land () shown edged red on the attached plan
- 1.11 **"Subsequent Nominee"** means a Nominee to be offered a Tenancy Agreement or Assignment pursuant to Clause 3.9
- 1.12 **"Tenancy Agreement"** means an assured Tenancy Agreement in a form prepared by the Registered Provider and containing terms which accord with the form of Tenancy Agreement being used by the Registered Provider from time to time for its

general lettings or such other form of tenancy as the Registered Provider specifies (acting reasonably)

- 1.13 **“Units”** means any of the Rented Units and “ Unit” will be construed accordingly
- 1.14 **“Vacancy Notice”** means a written notice given by the Registered Provider to the Council (in a form to be agreed between the Registered Provider and the Council within five weeks from the date of this Deed) the function of such notice being the notification to the Council by the Registered Provider that the construction and fitting out of the Unit is completed
- 1.15 **“Void”** means a Rented Unit which is vacant as a result of the tenant vacating the Rented Unit
- 1.16 **“Void Notice”** means a written notice given by the Registered Provider to the Council (in a form to be agreed between the Registered Provider and the Council within four weeks from the date of this Deed) the function of such a notice being the notification to the Council of a Void

2. Enabling Provisions

This Agreement is made pursuant to s111 of the Local Government Act 1972 s33 of the Local Government (Miscellaneous Provisions) Act 1982 and all other enabling powers

3. Procedure

The parties agree that the following nomination procedure shall apply to the nomination of persons in respect of the Units

Initial Lets

- 3.1 The Registered Provider shall give the Council not less than four months prior written notice of the date when the Initial Let Units will be ready for occupation

- 3.2 The Registered Provider shall serve on the Council a Vacancy Notice in respect of the Unit not less than two months prior to such newly constructed and previously unoccupied Unit becoming available for occupation
- 3.3 The Council shall within ten working days of receipt of a Vacancy Notice serve upon the Registered Provider details of a Nominee
- 3.4 Details of a Nominee served by the Council shall:
 - 3.4.1 specify the appropriate category of Unit to which it relates and
 - 3.4.2 include any other details that the Registered Provider may require from time to time
- 3.5 The Registered Provider shall have the right to let/grant the Initial Let in respect of the Units to persons of its own choosing (subject to provisions within the Section 106 Agreement) in the event of the Council's failure to serve details of the Nominees within the period of ten working days of receipt of the Vacancy Notice
- 3.6 The Registered Provider shall within ten working days of the date of receipt of the details of the Nominee use its reasonable endeavours to arrange viewing of the Unit and offer a Tenancy Agreement to the Nominee
- 3.7 If the Nominee fails to enter into a Tenancy Agreement within ten working days of receipt of the Registered Provider's offer of a Tenancy Agreement that Nominee shall be deemed to have rejected the Registered Provider's offer
- 3.8 If the Registered Provider offer of a Tenancy Agreement is deemed to have been rejected the procedure set out in clause 3.3 to 3.7 shall be repeated but for the purposes of this Clause the ten day period referred to in Clauses 3.3 to 3.6 shall be reduced to five working days
- 3.9 In the event a second Nominee fails to accept the Registered Provider's offer of a Tenancy Agreement within the time prescribed by Clause 3.7 then the Registered

Provider shall offer a Tenancy Agreement to a subsequent Nominee; the procedure set out in Clause 3.3 to 3.7 shall apply but for the purposes of this clause the ten day period referred to in those Clauses 3.3 to 3.7 shall be reduced to five working days.

- 3.10 The Registered Provider shall have the right to let the Initial Let in respect of the Unit to persons of its own choosing (subject to the provisions within the S106 Agreement) in the event of the Council's failure to serve details of the Nominees within the period of ten working days of receipt of the Vacancy Notice or if the Units have been offered to Nominees in accordance with the clauses above.

Voids

- 3.11 Should a Rented Unit become a Void after the Initial Let or the Registered Provider has reasonable cause to believe it will become a Void then and in each case

3.11.1 the Registered Provider shall serve a Void Notice in respect of the relevant vacant Unit upon the Council and

3.11.2 within five working days of receipt of the said notice the Council shall serve upon the Registered Provider details of a Nominee

- 3.12 The Registered Provider shall have the right to let the relevant vacant Unit to a person of its own choosing (subject to the provisions within the S106 Agreement) in the event of the Council's failure to serve details of a Nominee referred to in Clause 3.11 within five working days of receipt of the Void Notice

- 3.13 Upon receipt of the details of a Nominee referred to in Clause 3.11 the Registered Provider shall follow the procedure set out in Clauses 3.5 to 3.10 PROVIDING THAT except where the Void is an Exempted Void on each and every occasion that 75% of the Voids have been let the Registered Provider shall not be required to follow the procedure set down in Clauses 3.11 -3.13 and the Registered Provider shall then be entitled to let the remaining 25% of the Voids to a person of its own choosing (subject to the provisions within the S106 Agreement)

3.14 Where the Void is an Exempted Void the Registered Provider shall follow the procedure set out in Clauses 3.6 to 3.9 notwithstanding that 75% of the total number of Voids

Provision of information

3.15 The Registered Provider shall give notification to the Council of the occurrence of the following events within five working days of their occurrence:

3.15.1 a Nominee or Subsequent Nominee failing to view a Unit within 10 working days of an offer being made

3.15.2 a Nominee or Subsequent Nominee failing to accept the offer of a Tenancy Agreement within the time limit prescribed by this Agreement

3.15.3 a Nominee or Subsequent Nominee accepting an offer of a Tenancy Agreement

3.15.4 a person accepting an offer of a tenancy from the Registered Provider

3.15.5 the Registered Provider rejecting a Nominee or Subsequent Nominee in accordance with Clause 3.20

3.16 Within five working days of the Council receiving notice served in accordance with Clause 3.15 above save for notice under 3.15.4 the Council shall serve upon the Registered Provider the name and address of a Nominee or Subsequent Nominee to include the information set out in Clause 3.4

3.17 If the Council shall within the period mentioned in Clause 3.16 notify the Registered Provider that the Council then has no suitable Nominee or Subsequent Nominee the Council shall advise the Registered Provider of a suitable replacement Nominee or Subsequent Nominee as soon as reasonably practicable PROVIDING THAT the

Registered Provider agrees to the extension of time in which the Council has to nominate and such agreement shall not be unreasonably withheld

- 3.18 The Registered Provider shall have the right to let a Unit to a person of its choosing (subject to the provisions within the S106 Agreement) if the Council's failure to provide a Nominee or Subsequent Nominee creates a Void in respect of that Unit
- 3.19 On 1st April 1st July 1st October and 1st January in each year the Registered Provider shall serve the Council with details of the letting activities of the Units in a format to be agreed between the Registered Provider and the Council
- 3.20 The Registered Provider shall have the right to interview and make enquiries of each Nominee or Subsequent Nominee and by serving written notice upon the Council to that effect to reject any Nominee or Subsequent Nominee if in the opinion of the Registered Provider the grant of a Tenancy Agreement to such Nominee would be in contravention of the Registered Provider's registered rules or its letting criteria
- 3.21 When calculating percentage for the purposes of this Deed percentage in excess of 0.5 shall be rounded up and percentages equal to or less than 0.5 shall be rounded down
- 3.22 The Council and the Registered Provider agree that the nomination rights contained in this Deed may be varied from time to time but only by agreement in writing by the parties

4. Notices

Any notice required to be served hereunder shall be sufficiently served on the parties at the address indicated above or such other address notified by one party to the other and any notice shall have been deemed to have been served two working days after posting

5. Transfers to other Registered Providers

The Registered Provider shall ensure that any Registered Provider to which the Site and Units erected thereon are transferred otherwise than by direction of the HCA under its statutory powers shall enter into a similar agreement mutatis mutandis with the Council

6. Disputes

Where any matters fail to be agreed between the parties or any dispute or difference occurs the question shall be referred on the application of either party for the determination of a single expert to be agreed between the parties or in default of agreement to be nominated by the President for the time being of the Chartered Institute of Housing

7. Costs

The Registered Provider agrees with the Council to pay the legal costs which the Council incurs in preparing and entering into this Deed

8. Agreements and declarations

The parties agree:

8.1 nothing in this Deed fetters or restricts the exercise by the Council of any of its powers

8.2 the obligations contained in this Deed are covenants for the purpose of s33 of the Local Government (Miscellaneous Provisions) Act 1982

9. Restrictions on Nominations

9.1 The restrictions to be taken into account when serving upon the Registered Provider details of Nominees as set out in the S106 Agreement include the following:

9.1.1 Not to dispose of or cause or allow the disposal of any Affordable Housing

Unit other than to an individual residential purchaser tenant or occupant who (unless the District Council shall acting reasonably otherwise agrees in writing) satisfies the qualifications set out below namely that the person(s):

- (i) is an individual or are individuals;
- (ii) is considered in their reasonable opinion by the District Council or the Registered Provider in accordance with its rules or its allocations and lettings policies to be in need of the accommodation provided by the Affordable Housing Unit;
- (iii) is not able easily to compete in the open market for equivalent housing accommodation in the administrative area of the District Council;
- (iv) before taking up occupation of the Affordable Housing Unit has not owned a freehold or a lease for a term exceeding 3 years within the previous 12 months (save that the condition shall not apply where the District Council or the Registered Provider is satisfied that the circumstances of that person are such as to put him in need of housing) and intends to occupy and subsequently occupies the Affordable Housing Unit as his/her only or principal home;
- (v) has a Local Connection in respect of the Units

9.2 Where there is any discrepancy between this Deed and the s106 Agreement the S106 Agreement shall take priority

10. Exclusion Clause

The provisions of this Deed shall not be binding nor enforceable against any of the following:-

10.1 Any person who shall exercise a statutory right to buy or acquire any Unit;

10.2 Any mortgagee chargee (or any receiver appointed by such mortgagee or chargee) of a Registered Provider provided that such mortgagee or chargee or receiver so appointed shall have first complied with the procedure in clause X.X of the S106 Agreement

10.3 Any and all successors in title from the persons specified in clauses 9.1 – 9.2 above”

Executed as a Deed

By fixing the common seal of

()

in the

presence of:-

Authorised Signatory

Authorised Signatory

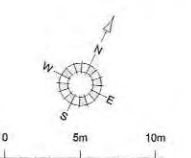
SEALED WITH THE COMMON SEAL OF

HORSHAM DISTRICT COUNCIL

in the presence of

Authorised Signatory

**SCHEDULE 13
PLAN AND SCHEDULE OF AFFORDABLE HOUSING UNITS IN PHASE 1D**



Total Site Area 1.207 Hectares

- FENCING & BOUNDARY DETAILS**
- Boundary Line
 - Fence
 - 1.8m Brick Wall
 - Footpath
 - Plot 45 Plot Number

- LANDSCAPING DETAILS**
- Proposed Trees & Hedges
 - Root Protection Area

- HOUSING TYPE**
- Private Housing
 - Affordable Housing



Handwritten initials 'BP'.

REV.	DATE	REVISIONS:	By	REV.	DATE	REVISIONS:	By	REV.	DATE	REVISIONS:	By

CLIENT:	Crest Nicholson	PROJECT:	Northern Parcels, Parcel 1D Kilnwood Vale
SCALE:	1:250 (A1 ORIGINAL)	DRAWING:	Proposed Site Plan (Private/Affordable Housing)
DRAWN:	DA	15023	P103
DATE:	23.07.15		

Broadmeads House
Farnham Business Park
Weydon Lane
Farnham, Surrey
GU9 8GT
Tel. 01252 267878
name.surname@osp
architecture.com
www.osparchitecture.com

OSPA
ARCHITECTURE

O'KEEFE SCANLON LIMITED

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osparchitecture.com

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Business Park, Weydon Lane
Farnham, Surrey GU14 8BT

Bristol office:
10 Victoria Street
Bristol, Avon BS1 6BN

01252 267878

0117 332 6753

Schedule of Accommodation

Project Name: Kilnwood Vale, Phase 1D

Project No: 15023

Client: Crest Nicholson

Date: 05/11/2015

Plot No	House Type	Ref	Storeys	Tenure	Area ft ²	Area m ²
1	2 Bed Apartment	-	GF	Affordable (R)	756	70.2
2	2 Bed Apartment	-	GF	Affordable (R)	753	70.0
3	1 Bed Apartment	-	GF	Affordable (R)	539	50.1
4	2 Bed Apartment	-	FF	Affordable (R)	756	70.2
5	2 Bed Apartment	-	FF	Affordable (R)	753	70.0
6	1 Bed Apartment	-	FF	Affordable (R)	539	50.1
7	2 Bed Apartment	-	SF	Affordable (R)	756	70.2
8	2 Bed Apartment	-	SF	Affordable (R)	753	70.0
9	1 Bed Apartment	-	SF	Affordable (R)	539	50.1
10	2 Bed Apartment	-	GF	Affordable (R)	753	70.0
11	1 Bed Apartment	-	FF	Affordable (R)	550	51.1
12	2 Bed Apartment	-	FF	Affordable (R)	753	70.0
13	1 Bed Apartment	-	SF	Affordable (R)	550	51.1
14	2 Bed Apartment	-	SF	Affordable (SO)	753	70.0
15	2 Bed Apartment	-	GF	Affordable (SO)	753	70.0
16	2 Bed Apartment	-	GF	Affordable (SO)	753	70.0
17	2 Bed Apartment	-	FF	Affordable (SO)	753	70.0
18	2 Bed Apartment	-	FF	Affordable (SO)	753	70.0
19	2 Bed Apartment	-	SF	Affordable (SO)	753	70.0
20	2 Bed Apartment	-	SF	Affordable (SO)	753	70.0
21	2 Bed Apartment	-	GF	Affordable (SO)	753	70.0
22	1 Bed Apartment	-	GF	Affordable (R)	550	51.1
23	2 Bed Apartment	-	FF	Affordable (SO)	753	70.0
24	1 Bed Apartment	-	FF	Affordable (R)	550	51.1
25	2 Bed Apartment	-	SF	Affordable (SO)	753	70.0
26	1 Bed Apartment	-	SF	Affordable (R)	550	51.1
27	3 Bed Semi-Detached	Type A	2	Private	1,054	97.9
28	2 Bed Semi-Detached	2BH1	2	Private	873	81.1
29	2 Bed Semi-Detached	2BH1	2	Private	873	81.1
30	3 Bed Semi-Detached	Type A	2	Private	1,054	97.9
31	3 Bed End Terrace	Type A	2	Private	1,060	98.5
32	3 Bed Mid Terrace	Type A	2	Private	1,060	98.5
33	3 Bed Mid Terrace	Type A	2	Private	1,060	98.5
34	3 Bed End Terrace	Type A	2	Private	1,060	98.5
35	FOG	-	FF	Private	744	69.1
36	FOG	-	FF	Private	742	68.9
37	FOG	-	FF	Private	741	68.8
38	2 Bed Apartment	-	GF	Private	756	70.2



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Business Park, Weydon Lane
Farnham, Surrey GU14 8DT

Bristol office:
10 Victoria Street
Bristol, Avon BS1 2BN

01252 267878

0117 332 6753

Schedule of Accommodation

Project Name: Kilnwood Vale, Phase 1D

Project No: 15023

Client: Crest Nicholson

Date: 05/11/2015

Plot No	House Type	Ref	Storeys	Tenure	Area ft ²	Area m ²
39	2 Bed Apartment	-	GF	Private	753	70.0
40	2 Bed Apartment	-	GF	Private	759	70.5
41	2 Bed Apartment	-	FF	Private	756	70.2
42	2 Bed Apartment	-	FF	Private	753	70.0
43	2 Bed Apartment	-	FF	Private	759	70.5
44	2 Bed Apartment	-	SF	Private	756	70.2
45	2 Bed Apartment	-	SF	Private	753	70.0
46	2 Bed Apartment	-	SF	Private	759	70.5
47	3 Bed End Terrace	Type A	2	Private	1,060	98.5
48	3 Bed Mid Terrace	Type A	2	Private	1,060	98.5
49	2 Bed Mid Terrace	2BH1	2	Private	862	80.1
50	3 Bed Mid Terrace	Type A	2	Private	1,060	98.5
51	3 Bed End Terrace	Type A	2	Private	1,060	98.5
52	3 Bed Semi-Detached	Type A	2	Private	1,060	98.5
53	3 Bed Semi-Detached	Type A	2	Private	1,060	98.5
54	3 Bed End Terrace	Type A	2	Private	1,054	97.9
55	2 Bed Mid Terrace	2BH1	2	Private	862	80.1
56	3 Bed End Terrace	Type A	2	Private	1,054	97.9
57	FOG	-	FF	Private	744	69.1
58	FOG	-	FF	Private	742	68.9
59	FOG	-	FF	Private	741	68.8
60	2 Bed Apartment	-	GF	Private	756	70.2
61	2 Bed Apartment	-	GF	Private	753	70.0
62	2 Bed Apartment	-	GF	Private	759	70.5
63	2 Bed Apartment	-	FF	Private	756	70.2
64	2 Bed Apartment	-	FF	Private	753	70.0
65	2 Bed Apartment	-	FF	Private	759	70.5
66	2 Bed Apartment	-	SF	Private	756	70.2
67	2 Bed Apartment	-	SF	Private	759	70.5
68	3 Bed Semi-Detached	Type A	2	Private	1,060	98.5
69	3 Bed Semi-Detached	Type A	2	Private	1,060	98.5
70	3 Bed End Terrace	Type A	2	Private	1,054	97.9
71	2 Bed Mid Terrace	2BH1	2	Private	862	80.1
72	3 Bed End Terrace	Type A	2	Private	1,054	97.9
Total					58,615	5,445.5

**SCHEDULE 14
PAYMENT NOTICE**

To Horsham District Council

For the attention of the Head of Legal and Democratic Services)

Parkside
Chart Way,
Horsham,
West Sussex RH12 1RL

We [] hereby pay to the Horsham District Council the following Sum(s)
pursuant to a planning agreement dated [] made between:

CREST NICHOLSON OPERATIONS LIMITED

and

PIERS HENRY CALVERT and HENRIETTA AMELIA CALVERT

and

PIERS HENRY CALVERT and RUTH MARGARET CALVERT AND JULIAN RICHARD
WHATELY AS EXECUTORS OF HENRY CLIFTON CALVERT (DECEASED

and

THE HOMES AND COMMUNITIES AGENCY

and

TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE
SCHEME

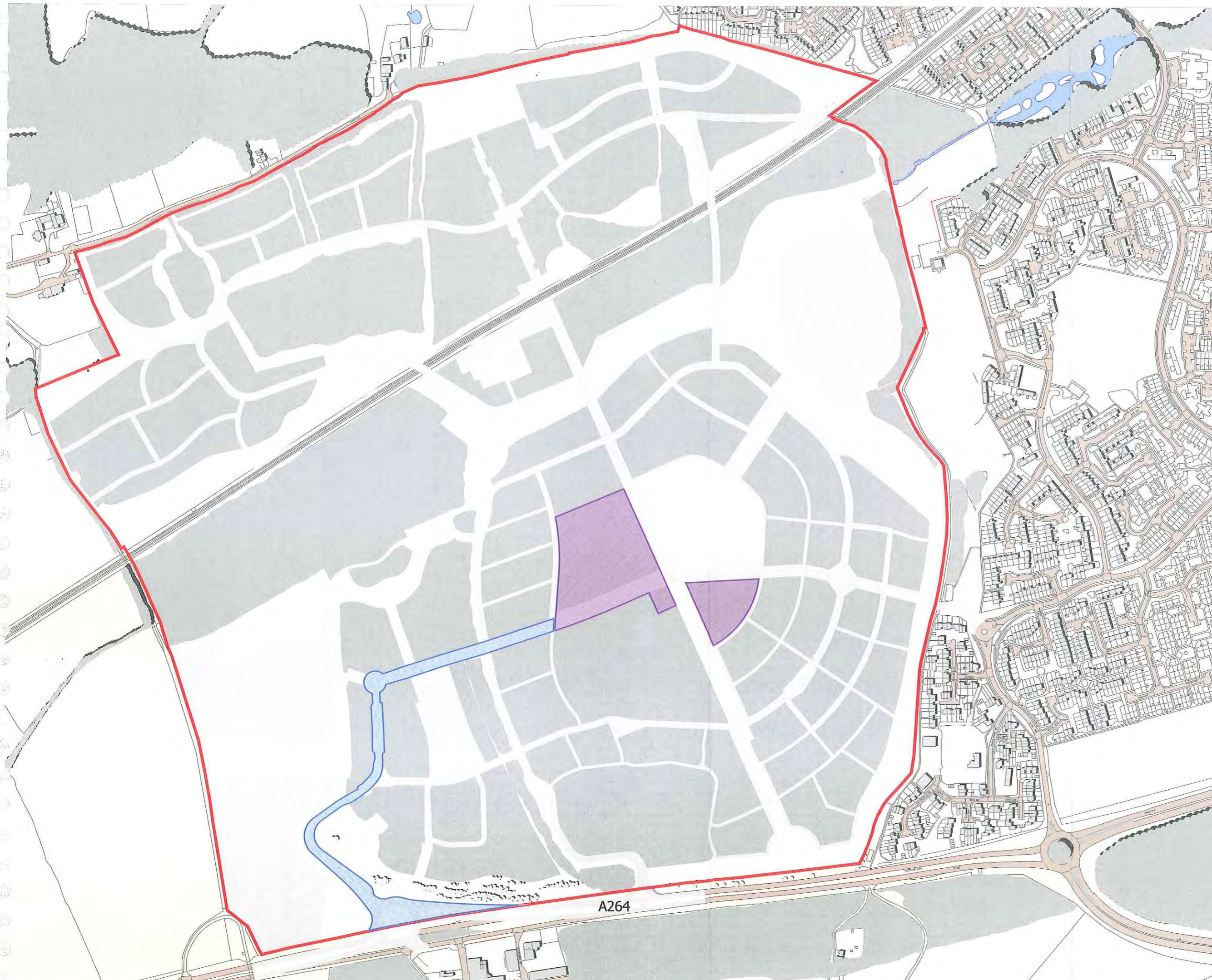
and

HORSHAM DISTRICT COUNCIL




relating to the development of land West of Bewbush now known as Kilnwood Vale

Amount of Contribution	Objects of Contribution [eg Open Space maintenance Tariff Payment]

**SCHEDULE 15
LINK ROAD PLAN**



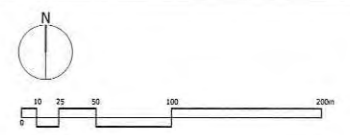
Contractors are not to scale dimensions from this drawing

- Legend**
-  Site Boundary
 -  Neighbourhood Centre
 -  Link Road



A48605

CSJ



BroadwayMalyan^{BM}

Architecture Urbanism Design
 3 Weybridge Business Park
 Addlestone Road
 Weybridge, Surrey
 KT15 2BW
 T: +44 (0)1932 845 599
 F: +44 (0)1932 856 206
 E: Wey@BroadwayMalyan.com
 www.BroadwayMalyan.com

Client
Crest Strategic
 Project
Kilwood Vale
Bewbush, Crawley
 Description
S106 Neighbourhood Centre

Status
Final
 Scale 1:2500@A1 NN Date April 2016
 Job Number 30885 Drawing Number S106.01 Revision --

IN WITNESS of which the parties have duly executed this Deed which is delivered on the date first before written

SIGNED as a DEED by)
DUNCAN REVOLTA)
In the presence of:)

Signature of Witness

Name (in BLOCK capitals):

Address:

Occupation:

SIGNED as a DEED by)
JEREMY COLIN FRY)
In the presence of:)

Signature of Witness

Name (in BLOCK capitals):

Address:

Occupation

SIGNED as a DEED by
BS PENSIONS TRUSTEES LIMITED
Acting by two Directors or a
Director and the Secretary

Director

Director/Secretary

EXECUTED as a DEED. The common seal of
by the **HOMES AND COMMUNITIES AGENCY**
acting by: was hereunto affixed
in the presence of:



Christine Wilson
Deputy Head of Legal



AUTHORISED SIGNATORY

AL805

EXECUTED as a DEED
by **CREST NICHOLSON**
OPERATIONS LIMITED
acting by

Director

Director/Secretary

THE COMMON SEAL of
HORSHAM DISTRICT
COUNCIL was hereunto affixed
In the presence of:

Authorised Signatory

SIGNED as a Deed by)
PIERS HENRY CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
RUTH MARGARET CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
JULIAN RICHARD WHATELY)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

SIGNED as a Deed by)
HENRIETTA AMELIA CALVERT)
in the presence of:)

Signature if Witness

Name

Address

.....

.....

Occupation

DATED 9th June 2016

CREST NICHOLSON OPERATIONS LIMITED

and

THE HOMES AND COMMUNITIES AGENCY

and

**TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE
SCHEME**

and

HORSHAM DISTRICT COUNCIL

**DEED OF AGREEMENT UNDER SECTION 106 OF THE TOWN AND COUNTRY PLANNING
ACT 1990**

relating to land

at Kilnwood Vale in the District of Horsham West Sussex

Planning Ref: DC/15/2435 PRS scheme RMA
Committee: Development Control (North)
Date: 5 April 2016
Minute Ref: DCN/121

Paul Cummins
Head of Legal and Democratic Services
Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL

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THIS DEED OF AGREEMENT IS MADE THE 9th DAY OF June

2016

BETWEEN:

- (1) **CREST NICHOLSON OPERATIONS LIMITED** (company registration number 01168311) of Crest House, Pycroft Road, Chertsey, Surrey KT16 9GN (the **Owner**); and
- (2) **THE HOMES AND COMMUNITIES AGENCY** of Arpley House, 110 Birchwood Boulevard, Birchwood, Warrington, WA3 7QH (the **First Chargee**); and
- (3) **TRUSTEES OF THE CREST NICHOLSON GROUP PENSION AND LIFE ASSURANCE SCHEME** being **DUNCAN REVOLTA** of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA AND **JEREMY COLIN FRY** of 49 Park Grove, Westbury-on-Trym, Bristol BS9 4LG AND **BS PENSIONS TRUSTEES LIMITED** (company registration number 2682277) of 19 Old Hillside Road, Winchester SO22 5LN and care of Baker & McKenzie LLP (ref JJS), 100 New Bridge Street, London EC4V 6JA (the **Second Chargee**); and
- (4) **HORSHAM DISTRICT COUNCIL** of Parkside, Chart Way, Horsham, West Sussex RH12 1RL (the **District Council**).

Parties (1) to 4 collectively referred to as the **Parties**

NOW THIS DEED WITNESSETH as follows:

1. **RECITALS**

- 1.1 The Owner is the registered proprietor of the Phase 2 Land and the Phase 3 Land with freehold title absolute registered at the Land Registry under Title Number WSX353549 and which the Owner warrants is free from incumbrances which would prevent the performance of the obligations contained in this Agreement
- 1.2 Title number WSX353549 is subject to registered charges in favour of the First Chargee and the Second Chargee
- 1.3 The District Council is the local planning authority for the purposes of the Act for the administrative district of Horsham in which the Phase 2 Land and the Phase 3 Land are situate and the Local Planning Authority for the purposes of planning obligations imposed pursuant to the provisions of Section 106 of the Act and by whom the provisions of this Deed relating to the Phase 2 Land and the Phase 3 Land are enforceable
- 1.4 This Deed is supplemental to and is to be read in conjunction with the affordable housing planning obligations and their associated definitions contained within the

Section 106 agreement dated 28th April 2016 relating to planning permissions DC/15/2813, DC/15/2561 and DC/16/0108 (the Principal Agreement)

- 1.5 Schedule 4 of the Principal Agreement provides for flexibility as to the manner in which Affordable Housing is to be delivered within the Phases of the Development and the District Council considers it expedient in this instance to enter into this supplemental Deed to reflect the terms that have been agreed with the Owner
- 1.6 The District Council has agreed with the Owner that in consideration of the approval of the Reserved Matters Scheme the 10 Affordable Rented Units that are required to be delivered by the Owner on the Reserved Matters Scheme Land shall be re-distributed within the balance of Phase 2 shown edged red and shaded orange on the plan at Appendix 1 to this Deed
- 1.7 The District Council and the Owner have further agreed that should any PRS Units within the Reserved Matters Scheme be disposed of as market housing within a period of 5 years from first occupation of each Block within that scheme then for every four PRS Units sold there shall either be delivered a Shared Ownership Unit (up to a maximum of 24) within the Phase 2 Land and/or the Phase 3 Land (shown edged red and respectively shaded orange and red on the plan at Appendix 1 to this Deed) or a financial contribution shall be paid in lieu for each of those Shared Ownership Units
- 1.8 The District Council resolved at a meeting of the Development Management Committee (North) on 5 April 2016 to grant Reserved Matters Approval subject to the entering into of this Deed
- 1.9 The parties hereto are satisfied that the provisions of this Deed comply with the requirements of Regulation 122 and Regulation 123 of the Community Infrastructure Levy Regulations 2010 as amended

2. DEFINITIONS

In this Deed it is hereby agreed between the Parties that unless otherwise stated below defined terms shall have the meaning given to them by Clause 2 of the Principal Agreement:

Block means any of the following 11 (eleven) blocks of residential development comprised within the Reserved Matters Scheme shown on the plan at Appendix 2 to this Deed and comprised of:

- the 4 (four) apartment buildings,
- the 5 (five) blocks of maisonettes; and
- the 2 (two) terraces of town houses (each collectively as single blocks)

Index Linked means adjusted in accordance with the following indexation formula:

$$\frac{A \times B}{C} = D$$

where:

A is the payment pursuant to the relevant clause

B is the last firm (not provisional or estimated) figure published for the retail price index (RPI) immediately prior to the date of due payment as set out in this Deed

C is the last firm (not provisional or estimated) figure published for the retail price index (RPI) immediately following the date of this Deed

D is the recalculated sum due

Phase 2 Land means the land shown edged red shaded orange on the plan at Appendix 1 to this Deed

Phase 3 Land means the land shown edged red shaded red on the plan at Appendix 1 to this Deed

PRS means a private rental scheme

PRS Block means a Block of PRS Units

PRS Sale Date means the date when any PRS unit is sold as market housing

PRS Units means a residential unit to be let as part of a PRS at the Development

Reserved Matters Approval means reserved matters approval with reference DC/15/2435 sought for Layout, Appearance, Landscaping, Scale and Access (in accordance with DC/10/1612) for Phase 2.1B of the Kilnwood Vale development, comprising 227 dwellings with ancillary residential facilities

Reserved Matters Scheme means the residential development to be carried out on the Reserved Matters Scheme Land pursuant to the Reserved Matters Approval

Reserved Matters Scheme Land means the land shown indicatively edged red on the plan at Appendix 2 to this Deed

Shared Ownership Unit Contribution means the sum of £65,000 per unit for up to 24 Shared Ownership Units as determined in accordance with paragraph 3.2 (b) of Schedule 1

3. STATUTORY PROVISIONS AND COVENANTS

- 3.1 This Deed is made pursuant to the provisions of Section 106 of the Act Section 1 of the Localism Act 2011 Section 111 of the Local Government Act 1972 as amended and all other statutory and enabling powers and shall be enforceable accordingly but

without prejudice to all and any other means of enforcing it at law or in equity or by statute and is intended to regulate the use and development of the Phase 2 Land and the Phase 3 Land with the intent that the obligations herein shall be planning obligations enforceable by the District Council with the intention that such planning obligations shall bind and run with the Phase 2 Land and the Phase 3 Land

- 3.2 The Parties hereby agree that the obligations created by this Deed are planning obligations for the purposes of Section 106 of the Act and are enforceable by the District Council and that the Phase 2 Land and the Phase 3 Land shall be subject in all respects to the covenants undertakings and obligations contained in this Deed

4. **INTERPRETATION**

- 4.1 In this Deed the singular includes the plural and vice versa unless the context otherwise requires words denoting the singular shall include the plural and vice versa and words denoting any one gender shall include all genders and words denoting persons shall include bodies companies unincorporated associations and partnerships
- 4.2 Any reference to the Owner or any other legal or natural person shall unless the context indicates otherwise include his her its or their heirs assigns and successors in title and in the case of any local authority shall also include any successor in function.
- 4.3 Any covenants obligations or other commitments given by more than one party shall be joint and several and where any party consists of two or more persons obligations expressed to be made by or with that party are deemed to be made by or with such persons jointly and severally.
- 4.4 References to Clauses Sub-Clauses and Schedules Paragraphs Plans and Sub-Paragraphs are references to clauses sub-clauses and schedules paragraphs plans and sub-paragraphs to this Deed unless the context otherwise requires
- 4.5 The schedules contained in this Deed shall be deemed to be incorporated herein and to have the same force and effect as if the provisions thereof were set out in the body of this Deed
- 4.6 Any paragraph headings in the body or in any schedule to this Deed are for ease of reference only and are not to be taken into account in the construction of this Deed
- 4.7 The District Council is for the purposes of the Act the local planning authority for the administrative district in which the Phase 2 Land and the Phase 3 Land is situated and by whom the obligations restrictions stipulations conditions and covenants contained in this Deed are enforceable
- 4.8 No person shall be liable in respect of any covenant restriction or obligation (or any breach thereof save in respect of any antecedent breach) once they shall have parted with their interest in that part of the Phase 2 Land or the Phase 3 Land to which the relevant covenants restrictions or obligations relate provided they shall have notified the District Council in writing of the name and registered office (if applicable) or

address of the new owner and the date and extent of the land transferred and the transfer has been registered at the Land Registry

- 4.9 The obligations restrictions and covenants contained in this Deed shall not be enforceable by or against any purchaser tenant or occupier or mortgagee of any individual Dwelling or chargee or receiver of any such persons or persons deriving title through or under any such persons or their successors in title and assigns or their mortgagees nor shall the consent seal or signature of any such persons or their mortgagees be required to amend adjust or supplement this Deed
- 4.10 Nothing herein contained or implied shall prejudice or affect the rights discretions powers duties and/or obligations of the District Council under all or any statutes by laws statutory instruments orders and/or regulations in the exercise of their functions as a local authority.
- 4.11 The parties to this Deed do not intend that any of its terms will be enforceable by virtue of the Contract (Rights of Third Parties) Act 1999 by any person not a party to it
- 4.12 The validity construction and performance of this Deed shall be governed by English Law and each party agrees to submit to the exclusive jurisdiction of the English Courts as regards any claim or matter arising under this Deed
- 4.13 Reference to any statute or statutory provisions includes a reference to:-
- 4.13.1 that statute or statutory provision as from time to time amended extended re-enacted consolidated or replaced; and
- 4.13.2 all statutory instruments or orders made pursuant to it whether before or after the date of this Deed.
- 4.14 The Owner hereby warrants to the District Council that no registerable interest exists which is not so registered at the Land Registry in respect of the Phase 2 Land and the Phase 3 Land at the date of this Deed.
- 4.15 It is hereby agreed between the parties hereto that failure by the District Council at any time to enforce the provisions of this Deed or to require performance strictly or otherwise by the Owners of any of the conditions covenants agreements or obligations of this Deed or any failure or delay by the District Council to exercise any right or remedy shall not be construed as a waiver of or creating an estoppel in connection with such condition covenant or agreement or obligation and shall not affect the validity of this Deed or any part thereof or the right of the District Council to enforce any provision and any variation shall not vitiate the remainder of the Deed which shall remain in full force and effect subject to such amendment or amendments.
- 4.16 All payments in accordance with the terms of this Deed shall be exclusive of any VAT payable in respect thereof

5. **INTEREST**

In the event that any sum payable under this Deed is not paid by the date on which the relevant payment is due under this Deed the Owner shall (subject always to paragraph 3.5 of Schedule 1 of this Deed) pay to the District Council interest on the sum due at the rate of four per centum per annum above the base lending rate for the time being in force of the Bank of England which shall be calculated on a day to day basis as the District Council may specify

6. **INDEXATION**

The Shared Ownership Unit Contributions payable pursuant to paragraph 3.5 of Schedule 1 of this Deed shall be Index Linked

7. **COSTS**

The Owner hereby agrees to pay to the District Council its reasonable legal costs prior to completion of this Deed

8. **REGISTRATION OF THIS DEED**

This Deed shall be registered as a local land charge in the Register of Local Land Charges against the Phase 2 Land and the Phase 3 Land

9. **CONDITIONALITY**

Save in respect of Clauses 1 to 10 and 12 to 14 which shall come into effect on the date hereof the provisions of this Deed shall come into effect on the date of the Reserved Matters Approval

10. **NOTICES**

10.1 any notice consent or approval required to be given under this Deed shall be in writing and shall be delivered personally or sent by pre-paid recorded delivery post

10.2 the address for service of any such notice consent or approval as aforesaid shall in the case of service upon the District Council be at the address aforesaid to be marked for the attention of the Head of Legal and Democratic Services or such other addresses for service as shall have been previously notified by the District Council to the Owners and in the case of service upon the Owners shall be at their registered office addressed to the Company Secretary or at their addresses aforesaid or such other addresses for service as shall have been previously notified by the Owners to the District Council respectively

10.3 a notice consent or approval under this Deed shall be deemed to have been served as follows:

10.3.1 if personally delivered at the time of delivery;

10.3.2 if posted recorded delivery at the expiration of 48 hours after the envelope containing the same was delivered into the custody of the postal authority within the United Kingdom;

and in proving such service it shall be sufficient to prove that personal delivery was made or that the envelope containing such notice consent or approval was properly addressed and delivered into the custody of the postal authority in a prepaid first class recorded delivery envelope (as appropriate)

11. OWNERS' COVENANTS

The Owner covenants with the District Council to comply with the obligations set out in this Deed and Schedule 1

12. SEVERABILITY

If any provision in this Deed shall be held to be invalid illegal or unenforceable the validity legality and enforceability of the remaining provisions hereof shall not in any way be deemed thereby to be affected or impaired

13. CHARGEES CONSENT

The First Chargee and the Second Chargee acknowledge and declare that this Deed has been entered into by the First Owner with their consent to the intent that the planning obligations in this Deed shall be binding on the Phase 2 Land and the Phase 3 Land and that the security of the respective charges over the Phase 2 Land and the Phase 3 Land shall take effect subject to this Deed provided that the First Chargee and the Second Chargee (as applicable) shall only be liable for any breach occurring whilst chargee in possession and shall not be liable for any pre-existing breach.

14. COUNTERPARTS

The Parties agree that this Deed may be completed by executed counterparts

SCHEDULE 1

Without prejudice to the affordable obligations within Schedule 4 of the Principal Agreement relating to Phase 2 the Owner hereby covenants and agrees with the District Council:

1. **Reserved Matters Scheme Notice**

To serve written notice on the District Council as soon as reasonably practicable confirming that the Reserved Matters Scheme has been implemented

2. **Re-distribution of Affordable Rented Units**

the Owner agrees that for the purposes of compliance with the terms of Schedule 4 of the Principal Agreement the implementation of the Reserved Matters Scheme shall trigger the requirement to provide within the Phase 2 Land the 10 (ten) Affordable Rented Units that it would otherwise have been required to deliver on the Reserved Matters Scheme Land and for the avoidance of doubt the 10 Affordable Rented Units are in addition to those already required to be delivered on the remainder of the Phase 2 Land but without prejudice to the percentage quantum of Affordable Housing Units that is required for Phase 2 pursuant to Schedule 4 of the Principal Agreement

3. **Re-distribution of Shared Ownership Units**

If within the period of 5 years from the first Occupation of each PRS Block any PRS Units within that PRS Block are subsequently sold as market housing ('Former PRS Units') then the following shall apply:

3.1. To notify the District Council in writing in respect of each sale of a PRS Unit as market housing within 10 Working Days of the PRS Sale Date

3.2. Following notification of the 4th PRS Sale Date the District Council will thereafter have 20 Working Days from receipt of the Owner's written notice to confirm to the Owner in writing whether it requires the Owner to EITHER:

a) provide within the Phase 2 Land and/or the Phase 3 Land up to 24 (Twenty Four) Shared Ownership Units whereby the actual number of Shared Ownership Units that may be required is to be determined as follows: one Shared Ownership Unit for every 4 Former PRS Units Occupied as market housing AND for the avoidance of doubt the mix of those Shared Ownership Units shall accord with Schedule 4 of the Principal Agreement in respect of Phase 2

OR

b) pay a Shared Ownership Unit Contribution for the number of Shared Ownership Units determined in accordance with paragraph 3.2 (a) above

- 3.3. Should the District Council fail to notify the Owner pursuant to paragraph 3.2 above within the relevant 20 Working Day period or such longer period as may be agreed between by the Owner (such agreement not to be unreasonably withheld or delayed) then the Owner shall be at liberty to comply with either (a) or (b) above at its discretion AND it shall notify the District Council of its decision as soon as reasonably practicable following the expiry of the 20 Working Day period
- 3.4. Where paragraph 3.2 (a) applies then the Owner shall deliver the relevant number and type of Shared Ownership Units within the Phase 2 Land and/or the Phase 3 Land and shall in respect of each residential Reserved Matters Submission for the Phase 2 Land and/or the Phase 3 Land provide details to the District Council confirming whether that submission includes any of the relevant number of Shared Ownership Units determined in accordance with paragraph 3.2 (a) above and which submission shall identify those units
- 3.5. Where paragraph 3.2 (b) applies then the Owner shall pay a Shared Ownership Unit Contribution to the District Council upon the PRS Sale Date of every 4th Former PRS Unit sold as market housing up to a maximum of 24 payments AND should the first four of those Former PRS Units be sold prior to the Owner receiving the Council's notice pursuant to paragraph 3.2 and electing payment under paragraph 3.2 (b) then the Owner shall not be required to pay any interest under Clause 5 of this Deed Provided that the first Shared Ownership Unit Contribution that is due is paid to the District Council as soon as reasonably practicable following the receipt of the District Council's notice and in any event within 20 Working Days
- 3.6. The District Council agrees with the Owner to use any Shared Ownership Contributions paid to it under paragraph 3.5 above solely for the purpose of providing Affordable Housing with the District of Horsham and that it will refund to the party that paid the contributions any balance of those contributions which has not been expended or committed to be spent by the District Council within 5 years from the date on which the relevant contribution was received.

IN WITNESS of which the parties have duly executed this Deed which is delivered on the date first before written

SIGNED as a DEED by)
DUNCAN REVOLTA)
In the presence of:)

Signature of Witness

Name (in BLOCK capitals):

Address:

Occupation:

SIGNED as a DEED by))
JEREMY COLIN FRY))
In the presence of:))

Signature of Witness

Name (in BLOCK capitals):

Address:

Occupation

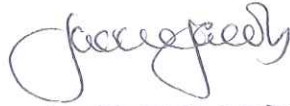
SIGNED as a DEED by
BS PENSIONS TRUSTEES LIMITED
Acting by two Directors or a
Director and the Secretary

Director

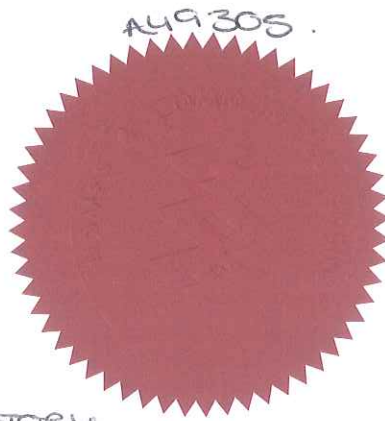
Director/Secretary

EXECUTED as a DEED. The Common Seal of
by the **HOMES AND COMMUNITIES AGENCY**
acting by: *was hereunto affixed*
in the presence of:

Jackie Jacob
Executive Director
Programmes



AUTHORISED SIGNATORY



EXECUTED as a DEED
by **CREST NICHOLSON**
OPERATIONS LIMITED
acting by

Director

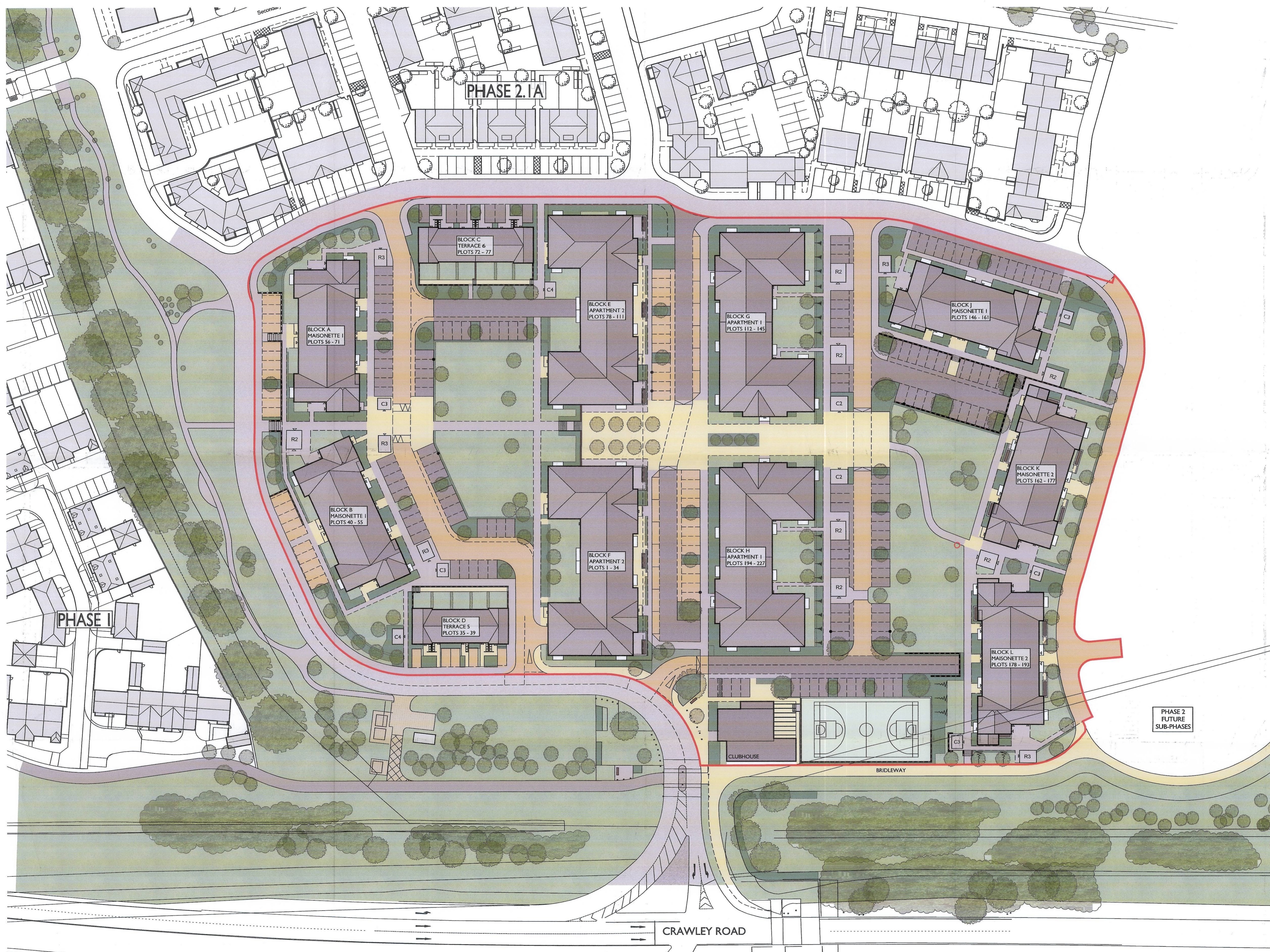
Director/Secretary

THE COMMON SEAL of
HORSHAM DISTRICT
COUNCIL was hereunto affixed
In the presence of:

Authorised Signatory

APPENDIX 1

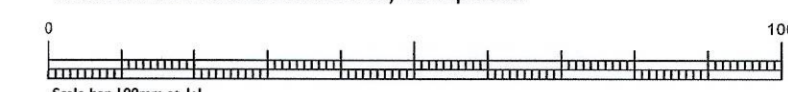
Phase 2 Land and Phase 3 Land



NOTES

This drawing to be read in accordance with the specification/Bills of Materials and related drawings.

No Dimensions to be scaled from this drawing. All stated dimensions to be verified on site and the Architect notified of any discrepancies.



NOTES

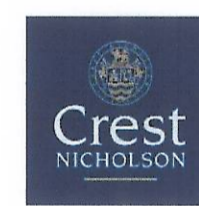
- EXISTING AND PROPOSED LEVELS HAVE BEEN TAKEN FROM O TOPOGRAPHICAL AND LEVEL INFORMATION PROVIDED BY CREST AND ARDENT.
- HIGHWAYS ARRANGEMENT IS SHOWN INDICATIVELY ONLY; REFER TO HIGHWAY ENGINEER'S DRAWINGS FOR DETAILED HIGHWAYS PROPOSAL. PROPOSED WORKS ARE SUBJECT TO AGREEMENT WITH LOCAL HIGHWAYS AUTHORITY.
- LANDSCAPING IS SHOWN INDICATIVELY ONLY.
- EXISTING TREES BASED ON SURVEY DATA. SUBJECT TO CONFIRMATION.
- HOUSING FOOTPRINTS AND INTERNAL ARRANGEMENTS SUBJECT TO PLANNING APPROVAL.
- REFER TO DETAILED ELEVATIONS AND STREETSCENES FOR ELEVATION TREATMENTS.
- SITE BOUNDARY BASED ON INFORMATION FROM CREST.
- ADJACENT LINEAR PARK SUBJECT TO SEPARATE APPLICATION. SHOWN INDICATIVELY ONLY.
- PHASE 2.1A SUBJECT TO SEPARATE APPLICATION. SHOWN INDICATIVELY ONLY.



KEY

- SITE BOUNDARY
- PROPOSED TREES
- REFUSE STORE FOR FLATS
- SERVICE MARGINS
- CYCLE STORE
- VENTS TO UNDERCROFT
- RETAINING WALLS
- LAND FALLS
- GREY ROOF TILES
- FIRE HYDRANT (POSITION TBC)
- POTENTIAL CAR CHARGING POINTS

FOR PLANNING



D	22.03.16	CYCLE STORES UPDATED	SM
C	08.03.16	HIGHWAYS UPDATED TO HIGHWAY ENGINEERS DESIGN	DH
B	08.03.16	HIGHWAYS UPDATED TO HIGHWAY ENGINEERS DESIGN	DH
A	23.10.15	GENERAL AMENDMENTS AS PER CLIENT COMMENTS	GD
REV	DATE	NOTE	IN

Project
PROPOSED RESIDENTIAL DEVELOPMENT
KILNWOOD VALE PHASE 2.1B
CRAWLEY ROAD, FAYGATE

Title
PROPOSED SITE LAYOUT

Scale
1:500 @A1

Date
MAY 2015

Drawn
RP/SM

Checked
MB

Drawing Number
7338/P101

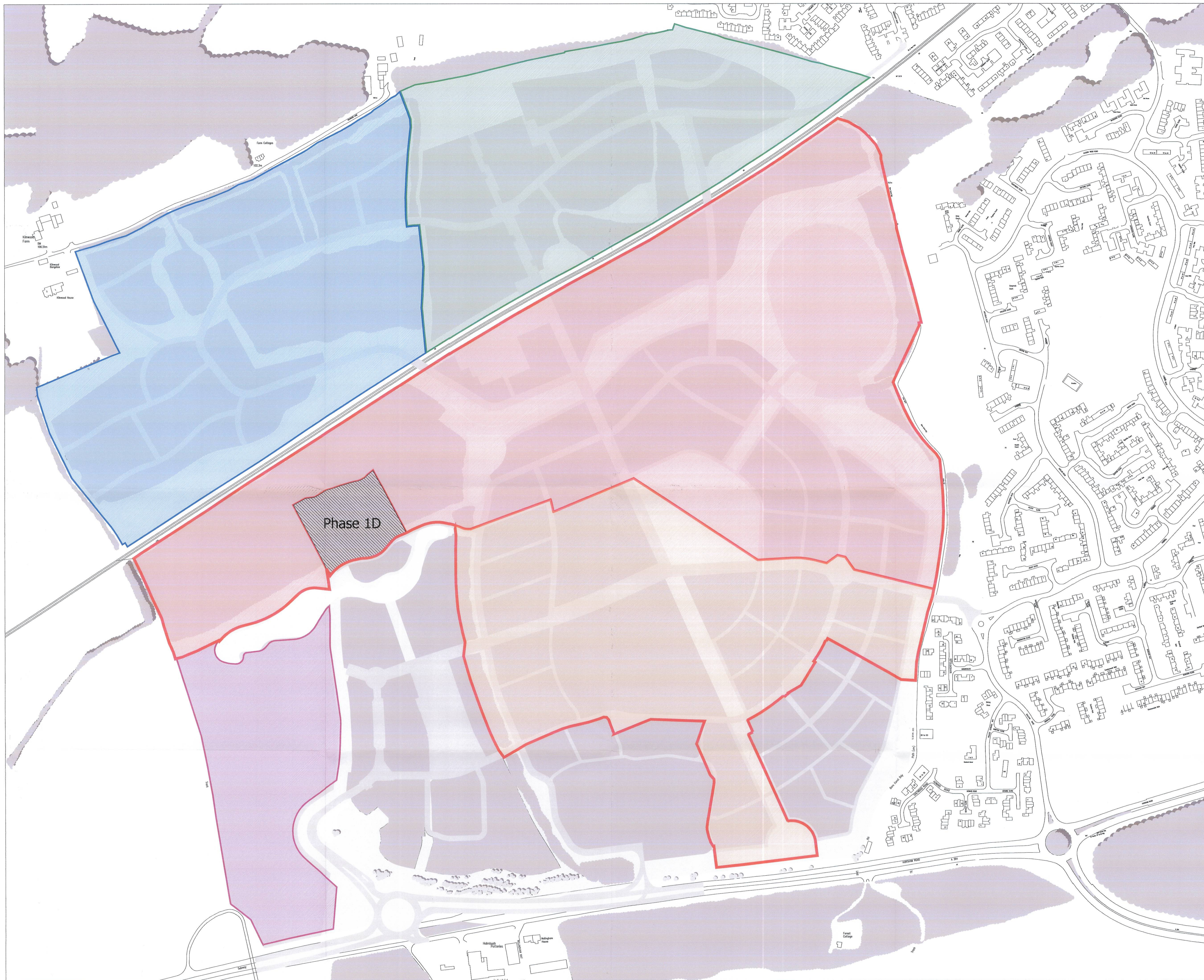
Revision
D

Saunders Partnership
 ARCHITECTURE | URBAN DESIGN | MASTER PLANNING










APPENDIX 2

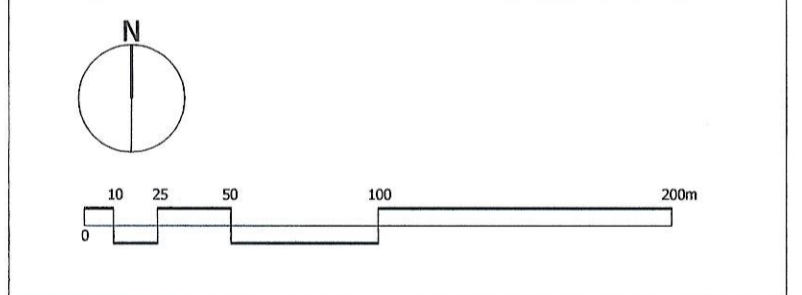
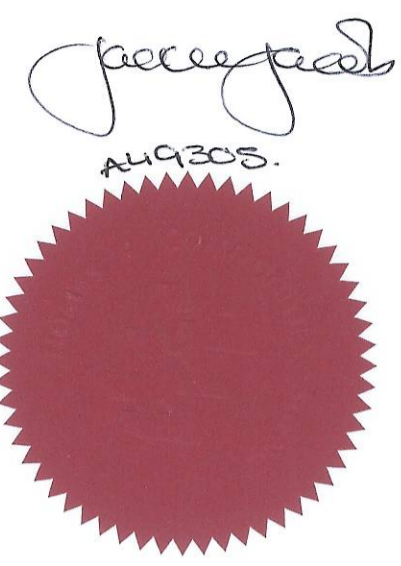
Reserved Matters Scheme Land and Block Plan



Contractors are not to scale dimensions from this drawing

Legend

-  Site Boundary
-  Phase 2
-  Phase 3
-  Phase 4
-  Phase 5
-  Reserve Land
-  Phase 1D



BroadwayMalyan^{BM}

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 E: Wey@BroadwayMalyan.com
 www.BroadwayMalyan.com

Client
Crest Strategic
 Project
Kilwood Vale
Bewbush, Crawley
 Description
S106 Agreement -
Phasing Plan

Status

Scale	Drawn By	Date
1:2500@A1 NT		Apr 2016
Job Number	Drawing Number	Revision
30885	403	

Appendix G

Moisture Content Laboratory Sheets

Moisture Content

Report No:	UXB0386661/353/M1	Report Date:	21 September 2017
		Our Contract Ref:	51014462/Collected
Client:	DUNTON ENVIRONMENTAL LTD	Tested By:	ESG Uxbridge
Address:	Dunton Environmental Ltd Unit 1 Tamebridge Ind.Est Aldridge Road Perry Bar Birmingham	Date Sampled:	13 Sep 2017
		Date Received:	13 Sep 2017
Client Contact:	Adrian Jefimiuk - Technical Engineer	Date Tested:	15 Sep 2017
Site:	Kilnwood Vale, Horsham, West Sussex RH12 4SE		
		Sampling Certificate:	Not Received
Material Supplier:	Site	Samples Submitted by:	Client
Material Source:	Site	Sampled by:	Client
Method of preparation:	BS1377-1:1990 7.4.2		

Results:

Sample Reference	Clients Reference	Location	Moisture Content(%)	Sample Type	Description
24672334	1	25% MC Surface	23	Bulk Bags	Clay (Natural)
24672335	2	25% MC Surface	27	Bulk Bags	Clay (Natural)
24672336	3	25% MC Surface	21	Bulk Bags	Clay (6% CKD)
24672337	4	25% MC Surface	21	Bulk Bags	Clay (6% CKD)
24672338	5	24% MC Surface	23	Bulk Bags	Clay (Natural)
24672339	6	24% MC Surface	24	Bulk Bags	Clay (Natural)
24672340	7	24% MC Surface	21	Bulk Bags	Clay (5% CKD)

Certified that the Moisture Content were determined in accordance with BS1377-2: 1990: 3.2

Signed:



**Mohamed Jaffer - Section Manager
for and on behalf of ESG**

Moisture Content

Report No:	UXB0386661/353/M1	Report Date:	21 September 2017
		Our Contract Ref:	51014462/Collected
Client:	DUNTON ENVIRONMENTAL LTD	Tested By:	ESG Uxbridge
Address:	Dunton Environmental Ltd Unit 1 Tamebridge Ind.Est Aldridge Road Perry Bar Birmingham	Date Sampled:	13 Sep 2017
		Date Received:	13 Sep 2017
Client Contact:	Adrian Jefimiuk - Technical Engineer	Date Tested:	15 Sep 2017
Site:	Kilnwood Vale, Horsham, West Sussex RH12 4SE		
		Sampling Certificate:	Not Received
Material Supplier:	Site	Samples Submitted by:	Client
Material Source:	Site	Sampled by:	Client
Method of preparation:	BS1377-1:1990 7.4.2		

Results:

Sample Reference	Clients Reference	Location	Moisture Content(%)	Sample Type	Description
24672341	8	24% MC Surface	20	Bulk Bags	Clay (5% CKD)
24672342	9	23% MC Surface	27	Bulk Bags	Clay (Natural)
24672343	10	23% MC Surface	24	Bulk Bags	Clay (Natural)
24672344	11	23% MC Surface	20	Bulk Bags	Clay (4% CKD)
24672345	12	23% MC Surface	21	Bulk Bags	Clay (4% CKD)
24672346	13	22% MC Surface	24	Bulk Bags	Clay (Natural)
24672347	14	22% MC Surface	24	Bulk Bags	Clay (Natural)

Moisture Content

Report No:	UXB0386661/353/M1	Report Date:	21 September 2017
		Our Contract Ref:	51014462/Collected
Client:	DUNTON ENVIRONMENTAL LTD	Tested By:	ESG Uxbridge
Address:	Dunton Environmental Ltd Unit 1 Tamebridge Ind.Est Aldridge Road Perry Bar Birmingham	Date Sampled:	13 Sep 2017
		Date Received:	13 Sep 2017
Client Contact:	Adrian Jefimiuk - Technical Engineer	Date Tested:	15 Sep 2017
Site:	Kilnwood Vale, Horsham, West Sussex RH12 4SE		
		Sampling Certificate:	Not Received
Material Supplier:	Site	Samples Submitted by:	Client
Material Source:	Site	Sampled by:	Client
Method of preparation:	BS1377-1:1990 7.4.2		

Results:

Sample Reference	Clients Reference	Location	Moisture Content(%)	Sample Type	Description
24672348	15	22% MC Surface	20	Bulk Bags	Clay (3% CKD)
24672349	16	22% MC Surface	20	Bulk Bags	Clay (3% CKD)
24672350	17	21% MC Surface	24	Bulk Bags	Clay (Natural)
24672351	18	21% MC Surface	24	Bulk Bags	Clay (Natural)
24672352	19	21% MC Surface	21	Bulk Bags	Clay (2% CKD)
24672353	20	21% MC Surface	20	Bulk Bags	Clay (2% CKD)

Appendix H

Hydrogeological Risk Assessment (ESI, 2017)

Kilnwood Vale: Hydrogeological Risk Assessment for Conditioning Soils with Cement Kiln Dust

17 November 2017



Kilnwood Vale: Hydrogeological Risk Assessment for Conditioning Soils with Cement Kiln Dust

Prepared for

Dunton Environmental Ltd
Unit 1, Tamebridge Industrial Estate
Aldridge Road
Perry Barr
West Midlands
B42 2TX

Report reference:
66444R1, November 17

Report status:
Final Report

CONFIDENTIAL
Prepared by ESI Limited

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ESI Ltd., New Zealand House, 160-162 Abbey Foregate, Shrewsbury, Shropshire SY2 6FD

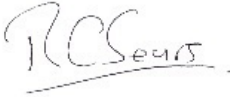


Shrewsbury 01743 276 100	Reading 01189 572 915	Cardiff 02920 660 144
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Kilnwood Vale: Hydrogeological Risk Assessment for Conditioning Soils with Cement Kiln Dust

This report has been prepared by ESI Ltd. (ESI) in its professional capacity as environmental specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by ESI solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to ESI at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, ESI may, by prior written agreement, agree to such release, provided that it is acknowledged that ESI accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. ESI accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against ESI except as expressly agreed with ESI in writing.

	Name	Signature
Author	Rob Sears	
Checked by	Chris Berryman	
Reviewed by	Francis Crozier	

Revision record:

Issue	Date	Status	Comment	Author	Checker	Reviewer
1	01 November 2017	Draft	Draft for client comment	RCS	CJB	FKC
2	16 November 2017	Final	Incorporated client comments	RCS	CJB	FKC

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APPENDICES

Appendix A	Drawing DTR15549 – Remaining Areas Plan – KV
Appendix B	Permeability testing data
Appendix C	Laboratory Leaching test results
Appendix D	Bewbush water quality data

1 Introduction

1.1 Background

Crest Strategic Projects is currently developing housing at a site at Kilnwood Vale on the outskirts of Crawley (the Site) as shown on Figure 1.1.

Dunton Environmental is the Contractor constructing the development platform for the Site. Dunton Environmental is currently conditioning the soils, used in the development platform, with lime, in order to manage the moisture content and is exploring the option of using cement kiln dust (CKD) as an alternative to lime. CKD is a waste product from the manufacture of cement and, as such, Dunton Environmental, will require an Environmental Permit in order to mix CKD into in-situ soils. A hydrogeological risk assessment (HRA) is required in order to support an application for an Environmental Permit.

1.2 Scope of work

ESI Limited (ESI) has been instructed by Dunton Environmental Limited (Dunton Environmental) to undertake a Hydrogeological Risk Assessment (HRA) to assess the risk to controlled waters (groundwater and surface waters) from the use of Cement Kiln Dust (CKD) as a soil moisture conditioner in the construction of the development platform within Phases 2 and 3 of the Site.

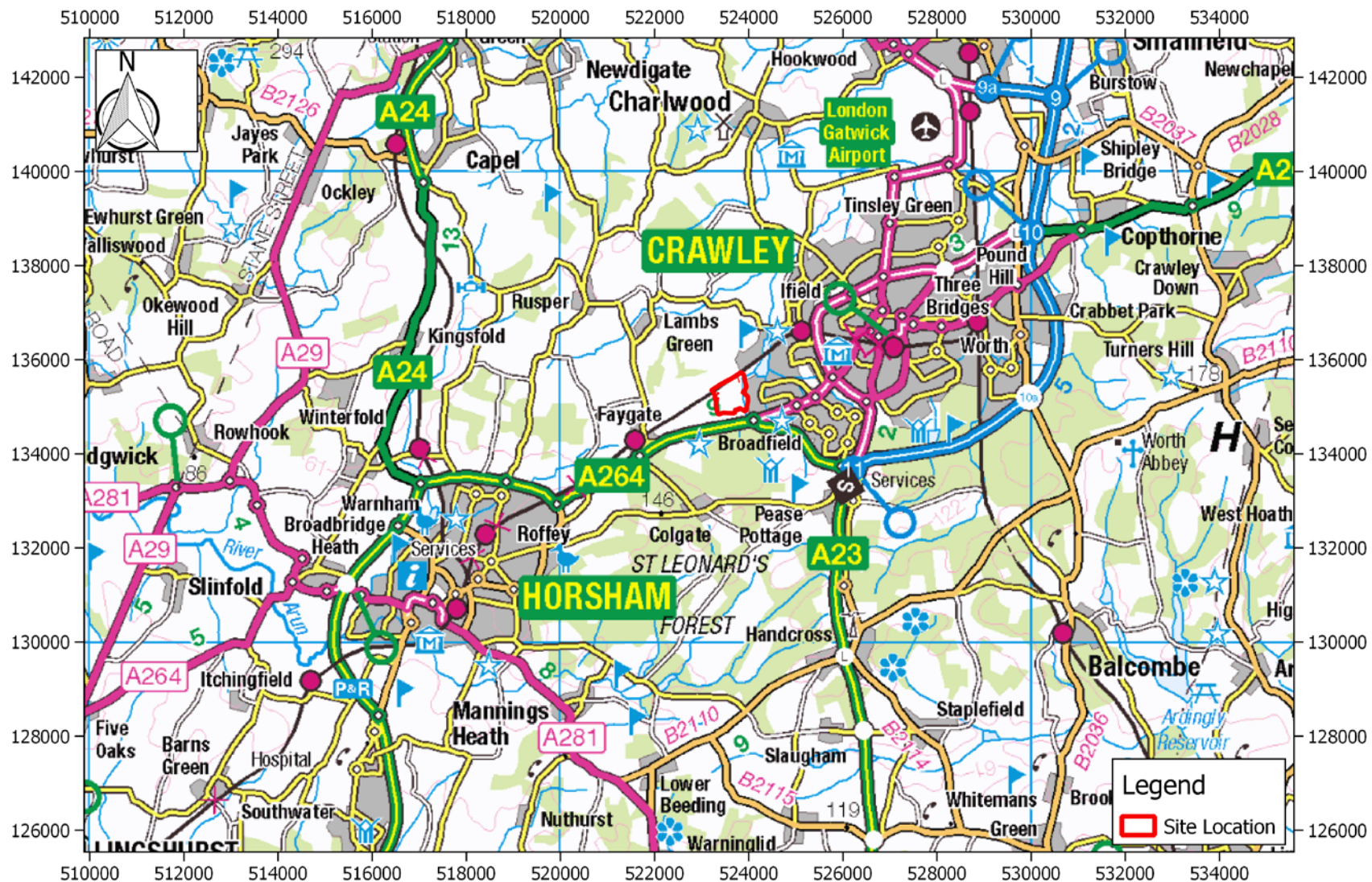


Figure 1.1 Site location

2 Physiographic setting

2.1 Site layout

The Site lies within the Kilnwood Vale Phase 2 & 3 development area, approximately 3.7 km to the west of Crawley town centre and just off the A264 (Crawley Road). The approximate National Grid Reference for the centre of the Site is TQ235 347.

The majority of the Site lies within the footprint of the former Holmbush Landfill. This is open ground and typically covered with grass. Bewbush Brook runs in an approximate west to east direction through the northern third of the Site (Figure 2.1).

2.2 Previous investigations

Campbell Reith (2016a) describes previous site investigations undertaken at the Site between 2004 and 2016, including:

- 2002 and 2004: SLR, Kilnwood Vale, Land Quality Assessment, June 2010, Reference 403-0404-00027;
- 2007 to 2009: SLR, Kilnwood Vale, Land Quality Assessment, June 2010, Reference 403-0404-00027;
- 2012: Southern Testing Ltd, Factual Report, Kilnwood Vale, Bewbush, Crawley, 28 May 2012. Report Reference J10963;
- September/October 2013: Southern Testing Ltd, Factual Report, Phase 2 and 3, Kilnwood Vale, Bewbush, Crawley, 9 January 2014, Report Reference J11531;
- 2015: Wilson Bailey Partnerships;
- May 2015: Southern Testing Ltd, Factual Report, Phase 2.1 Kilnwood Vale, Bewbush, Crawley, 15 June 2015, Report Reference J12223 (revision 2); and,
- December 2015: Southern Testing Ltd, Factual Report, Phase 2.2, Kilnwood Vale, Bewbush, Crawley, 9 December 2015, Report Reference J12276 (revision 4).

These documents were provided to ESI by Dunton Environmental in order to undertake this HRA.

2.3 Geology

2.3.1 Regional geology

The regional geology of the area comprises the Weald Clay (SLR, 2010) which comprises shales and mudstones formed during the Cretaceous period (Figure 2.1). According to geological mapping, the northern boundary of the Site is underlain by a surface exposure of the Horsham Stone Member. This is a 50 to 100 m wide outcrop of thinly bedded calcareous sandstone. SLR (2010) notes that it is very thin (0.3 m thick) in the Bewbush area but elsewhere may be up to 9 m thick. The clay formation dips gently to the north such that the Horsham Stone would not be present at depth to the south of its recorded outcrop area. Further to the north, a horizon of limestone is recorded within the Weald Clay. Again, SLR (2010) notes that no significant bands of limestone have been encountered during site investigation.

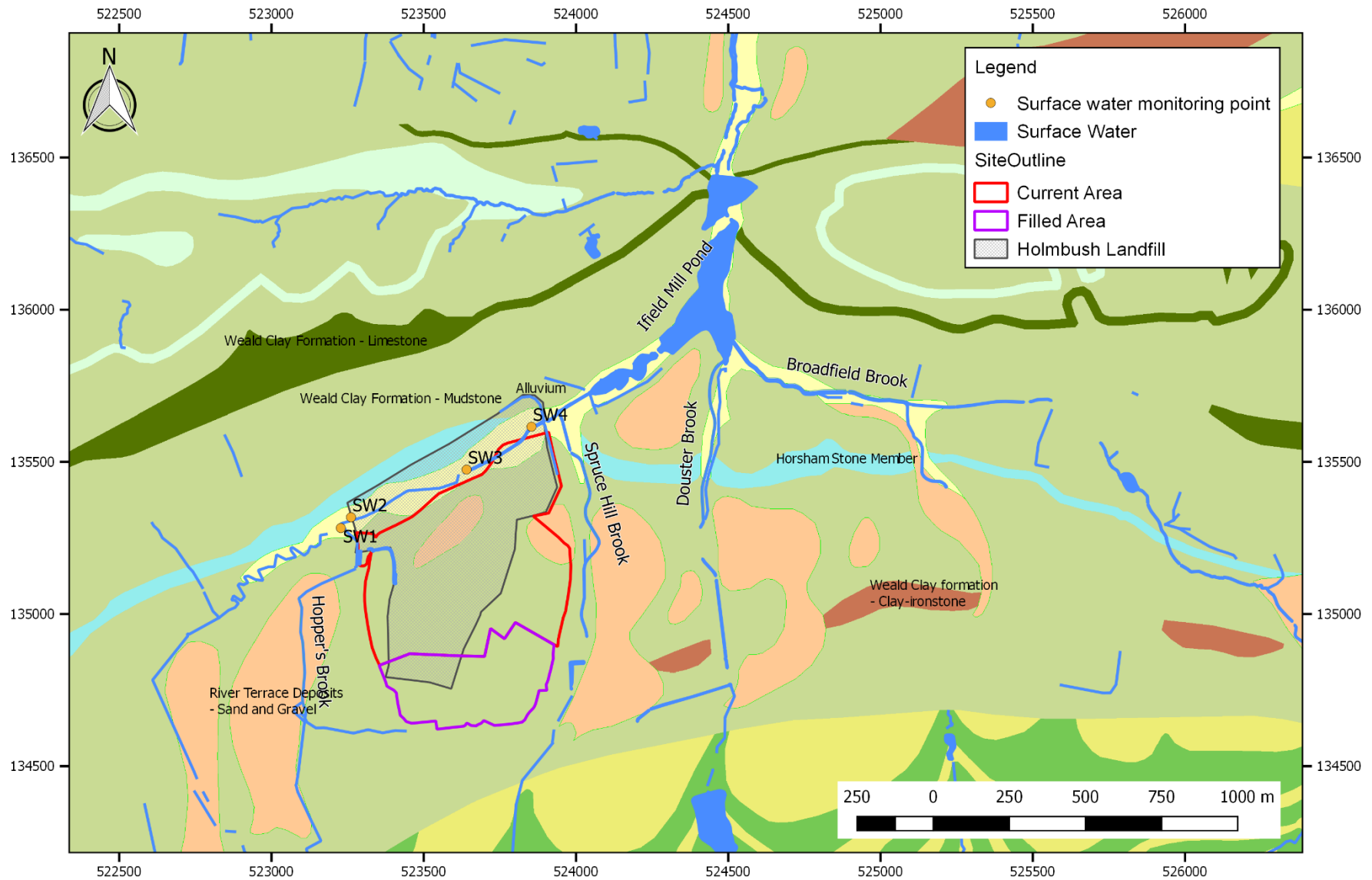


Figure 2.1 Regional geology and surface water features

Across the majority of the area, the solid geology outcrops, with small patches of superficial sand and gravel cover and alluvium associated with Bewbush Brook.

Across much of the Site area, the solid and superficial deposits are covered by fill materials of the Holmbush Landfill.

2.3.2 Local geology

SLR (2010) reports on site investigations undertaken at that time. Made Ground at the Site (fill materials associated with Holmbush Landfill) comprises light brown to grey fine to coarse silty sandy gravel to boulders of crushed concrete with varying amounts of brick, plastic, metal timber and tarmac.

The alluvial deposits encountered around Bewbush Brook comprise a soft to firm grey to orange brown silty, slightly peaty clay with black staining and containing a greater proportion of wood, roots and rootlets.

The Weald Clay comprised light grey, mottled orange-brown mudstone which had weathered to light-grey and orange-brown mottled silt. The Horsham Stone has not been encountered during any of the site investigations undertaken to date.

2.4 Hydrology

Three watercourses cross, or flow adjacent to, the Site; Bewbush Brook, and its tributaries Hopper's Brook and Spruce Hill Brook (Figure 2.1). Spruce Hill Brook lies approximately 100 m to the east of the Site and Hopper's Brook 200 m to the west. Both flow northwards into Bewbush Brook.

Bewbush Brook has been partly channelled across the former Holmbush Landfill and drains from west to east. Topographical surveying from May 2015 shows Bewbush Brook at an elevation of 74.60 mAOD in the west, falling to 71.30 mAOD in the east. Bewbush Brook flows into Ifield Mill Pond off-site to the north east and ultimately discharges to the River Mole. Photos of Bewbush Brook are shown in Photo 2.1 to Photo 2.5. These show the incised nature of the water channel. The photos were taken on 26 October under relatively low flow conditions, but the nature of the channel suggests that flow rates could be significantly higher.

Campbell Reith (2016b) provides an estimate of the flow rate based on on-site measurements on 9 May 2017. A flow rate of $3.6 \times 10^{-4} \text{ m}^3/\text{s}$ is estimated for Bewbush Brook.

Bewbush Brook runs within an incised channel as shown by the contours on Drawing DTR15549 – Remaining Areas Plan – KV (03) which is included in Appendix A. It is assumed that structures will not be built within 10 or so metres of the Brook given the steep slopes and in order to keep the structures out of the flood zone. It is expected that the Brook shows as flashy response as it mostly runs across low permeability Weald Clay and runoff to surface water after rainfall events will be significant.

SLR (2010) provide data and a commentary on surface water quality for Bewbush Brook. Routine surface water quality monitoring is undertaken at four locations along Bewbush Brook (SW1 to SW4) as indicated on Figure 2.1. Monitoring points SW1 and SW2 are upgradient of the site, SW3 is mid-gradient and SW4 is down-gradient. SLR (2010) report that two additional monitoring points (SW5 and SW6) were added in 2007, located in surface water ponds on the western boundary of the landfilled area, however ESI has not been able to locate these on a plan. A summary table of data for SW1 – SW4, as presented in SLR (2010) is reproduced here as Table 2.1. The following bulleted discussion points relating to surface water quality is taken directly from SLR (2010).

- Chloride concentrations in Bewbush Brook were consistently below the UK DWS of 250 mg/l at all monitoring locations, with concentrations fluctuating between approximately 20 mg/l and 150 mg/l. The highest concentrations have typically been recorded at the upstream location, SW1, although in 2008 all four monitoring locations on the Brook recorded similar concentrations.
- Ammoniacal nitrogen concentrations are generally less than 1 mg/l and frequently below the laboratory reporting limit of 0.3 mg/l at Bewbush Brook. Occasional peaks are observed, with concentrations returning rapidly to low levels.
- With regards to other monitored determinands, the majority remain at or below laboratory reporting limits, UK DWS values or EQS freshwater standards.
- The results of List 1 (hazardous substance) analyses during 2007 recorded the majority of the determinands below detection limits. PAHs were recorded at all of the monitoring points, the highest concentration of 16 µg/l being recorded at SW2 in September 2007, although the reading for November 2007 was only 0.2 µg/l. The highest benzo-a-pyrene concentration of 2.2 µg/l was recorded at SW2 in September 2007. SW2 is an upstream monitoring point and the highest concentrations are isolated peaks suggesting that the results are either erroneous or otherwise have been caused by a source upstream of Holmbush Farm Landfill. It should also be noted that the concentrations recorded at SW3, downstream of SW2 and close to the centre of the brook's passage through the landfill area, are typically comparable or lower than those recorded at SW2 which suggests that the landfill is not having an adverse effect on surface water quality.
- The in-waste borehole closest to SW2 is BH4, from which no List I (hazardous substance) organic substances have been detected above the lower reporting level, which further indicates that the waste material is not the source of the PAH concentrations recorded at SW2.
- A potential alternative source of PAHs could be the railway line which runs along the northern boundary of Holmbush Farm Landfill site. It is noted that, of the six surface water monitoring points, SW2 is located closest to the tracks. It is understood that water draining from fields to the north of the railway flows beneath the railway in a series of culverts which are then presumed to feed Bewbush Brook.
- Vegetation and organic rich sediments associated with the former Bewbush Pond which previously occupied much of the area between monitoring locations SW3 and SW4 may also have the potential to give rise to intermittent elevated concentrations of organic parameters at the down gradient monitoring point SW4.

Recent water quality for Bewbush Stream is presented on Table 2.2. These data are collected from SW4, downstream of the development. Laboratory certificates are presented in Appendix D. These data are consistent with the data and discussion provided by SLR (2010). pH is neutral and electrical conductivity is modest implying there are no high concentrations of ionic species. Total organic carbon, biological oxygen demand and chemical oxygen demand are all low implying that there are organic contaminants utilising organic degradation. Dissolved cadmium is slightly elevated for the samples taken between April and September. However, it is low (below the level of detection) in October. Monohydric phenols are not detected. There are a number of polycyclic aromatic hydrocarbon (PAH) species detected at low concentrations including: naphthalene (all samples), acenaphthene (one sample), phenanthrene (all samples), fluoranthene (two samples) and pyrene (two samples).

With the exception of the PAH species, the water quality in Bewbush Brook is considered to be high.



Photo 2.1 Bewbush Brook in the vicinity of Sample Location 2 (Figure 2.1)



Photo 2.2 Bewbush Brook in the vicinity of Sample Location 2 (Figure 2.1)



Photo 2.3 Bewbush Brook in the vicinity of Sample Location 3 (Figure 2.1)



Photo 2.4 Bewbush Brook in the vicinity of Sample Location 4 (Figure 2.1)



Photo 2.5 Bewbush Brook in the vicinity of Sample Location 5 (Figure 2.1)

Table 2.1 Surface water quality data: Bewbush Brook (after SLR, 2010)

Parameter	Unit	SW1				SW2				SW3				SW4			
		No.	Min	Mean	Max	No.	Min	Mean	Max	No.	Min	Mean	Max	No.	Min	Mean	Max
Alkalinity (as CaCO ₃)	mg/l	15	1	147	240	7	41	95	185	10	48	94	194	11	50	94	164
Ammoniacal Nitrogen as N	mg/l	19	0.05	0.4	1.8	10	<0.04	0.5	1.9	13	<0.04	0.3	1.7	13	<0.04	0.2	0.8
BOD + ATU (5 day)	mg/l	6	<1	2.1	5	6	<1	1.4	4	6	<1	1.7	5	6	<1	2.9	13
Calcium	mg/l	18	36	109	219	9	30	74	221	13	30	56	105	13	38	62	122
Chloride	mg/l	19	32	72	139	10	32	46	74	14	32	39	45	14	31	38	46
Chromium	mg/l	13	<0.005	0.003	0.007	4	<0.005	0.01	0.05	8	<0.005	<0.005	<0.005	8	<0.005	0.004	0.008
COD	mg/l	19	27	67	148	10	25	147	762	14	25	114	544	14	10	115	800
Conductivity	uS/cm	19	273	667	1140	10	269	447	969	14	281	389	551	14	291	406	561
Copper (filtered)	mg/l	13	<0.005	0.003	0.006	4	<0.005	0.003	0.006	8	<0.005	0.003	0.005	8	<0.005	0.003	0.007
Copper (Total)	mg/l	13	<0.005	0.006	0.026	4	<0.005	0.039	0.12	8	<0.005	0.011	0.031	8	<0.005	0.011	0.03
Dissolved O ₂	mg/l	13	3.7	5.9	11.5	4	3.4	5.2	7.4	7	3.7	6.1	7.8	7	4.1	5.9	8.0
Iron (filtered)	mg/l	13	0.23	1.2	5.4	4	0.79	19	70	8	0.62	14	85	8	0.43	5.3	18.1
Iron (total)	mg/l	13	<0.05	0.06	0.25	4	<0.05	0.17	0.51	8	<0.05	0.12	0.32	8	<0.05	0.10	0.28
Lead	mg/l	13	<0.005	0.015	0.130	4	<0.005	0.079	0.27	8	<0.005	0.015	0.042	8	<0.005	0.014	0.064
Magnesium	mg/l	18	4.8	9.8	18	9	4.7	8.1	14	13	4.2	6.9	10	13	4.8	7.2	11
Manganese	mg/l	13	0.05	1.1	3.2	4	0.54	11	41	8	0.13	24	175	8	0.03	7.9	52
Nickel	mg/l	13	<0.005	0.003	0.006	4	<0.005	0.034	0.13	8	<0.005	0.012	0.057	8	<0.005	0.006	0.017
Nitrogen (TON)	mg/l	15	0.15	1.2	3.6	7	0.4	2.9	9.5	10	0.15	2.6	6.8	11	<0.3	3	7.6
pH		19	7.0	7.6	8.6	10	7.2	7.4	7.7	14	6.7	7.3	7.6	14	7.0	7.4	7.6

Parameter	Unit	SW1				SW2				SW3				SW4			
		No.	Min	Mean	Max	No.	Min	Mean	Max	No.	Min	Mean	Max	No.	Min	Mean	Max
Phenols Mono	mg/l	5	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1
Potassium	mg/l	15	3.6	7.5	12	7	3.5	5.9	12.0	10	3.1	4.2	6	11	2.4	4.1	6.7
Sodium	mg/l	15	24	50	82	7	17	33	55	10	18	26	32	11	19	26	34
Sulphate as SO4	mg/l	15	36	148	338	7	15	94	336	10	7	34	66	11	6	37	71
Total organic carbon	mg/l	19	4.8	13.8	27.3	10	6.6	10.9	18.3	14	6.9	10	13	14	7	10	15
Zinc	mg/l	13	<0.005	0.018	0.061	4	0.012	0.21	0.74	7	0.011	0.061	0.25	9	0.007	0.048	0.140

Table 2.2 Recent water quality: Bewbush Stream, downstream of development

Determinand	Unit	Detection Limit	17/04/2017	05/07/2017	22/09/2017	19/10/2017
			SW4	SW4	SW4	SW4
pH	pH Units	n/a	7.9	7.3	7.6	7.5
Electrical Conductivity	uS/cm	5	417	631	504	480
Chloride	mg/l	1	44	68	45	40
Total Organic Carbon (TOC)	mg/l	0.1	7.4	13.3	61	7.5
Chemical Oxygen Demand	mg/l	5	13	26	19	15
Biological Oxygen Demand	mg/l	5	< 5	13	23	7
Total Suspended Solids	mg/l	5	43	96	5	9
Settleable Solids	mg/l	10				< 10
Cadmium (dissolved)	ug/l	0.4	31	80.6	52.5	< 0.4
Magnesium (dissolved)	mg/l	0.1	4.9	7.4	4.8	5.4
Total Phenols (monohydric)	ug/l	10	< 10	< 10	< 10	< 10

			17/04/2017	05/07/2017	22/09/2017	19/10/2017
Determinand	Unit	Detection Limit	SW4	SW4	SW4	SW4
Naphthalene	ug/l	0.01	0.02	< 0.01	0.02	0.02
Acenaphthylene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	ug/l	0.01	0.01	< 0.01	< 0.01	< 0.01
Fluorene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	ug/l	0.01	0.02	0.06	0.03	0.02
Anthracene	ug/l	0.01	< 0.01	0.01	< 0.01	< 0.01
Fluoranthene	ug/l	0.01	< 0.01	0.11	0.02	< 0.01
Pyrene	ug/l	0.01	< 0.01	0.08	0.02	< 0.01
Benzo(a)anthracene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	ug/l	0.008	< 0.008	< 0.008	< 0.008	< 0.008
Total EPA-16 PAHs	ug/l	0.01	0.05	0.26	0.09	0.04

2.5 Hydrogeology

The Weald Clay is defined as non-aquifer with the Horsham Stone Member defined as a Secondary A aquifer. Secondary A aquifers contain permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Clearly, a hydraulic connection to surface water is necessary for a baseflow contribution to be provided.

Campbell Reith (2016a) notes that there is localised groundwater present in sandy bands within the Weald Clay. It is unlikely that there is any significant hydraulic connection between these bands and thus the bulk permeability of the Clay will be low.

Campbell Reith (2016a) also notes that there are no groundwater abstraction wells within 1km of the Site confirming that the Weald Clay strata do not provide any groundwater resource. It also notes that disused wells are shown on Ordnance Survey mapping which it considers to have not intercepted significant quantities of water.

A triaxial cell permeability test of a sandy clay (either Made Ground or Weald Clay, details of location not provided) yielded a permeability of 4.2×10^{-10} m/s Campbell Reith (2016a).

Permeability tests of Class 2C material have been undertaken on material selected for use in the low permeability layer by Dunton and reports are presented in Appendix B. These include four triaxial cell permeability tests which yielded results of between 4.0×10^{-11} and 5.9×10^{-10} m/s. Two soakaway tests were also undertaken which yielded permeabilities of 2.8×10^{-8} and 7.9×10^{-8} m/s. All of these test results are lower than the design permeability of 1×10^{-7} m/s for the low permeability layer.

Campbell Reith (2016b) provides an estimate of groundwater flow at the site. A review of the parameters used in its estimation show them to be plausible. Table 2.3 presents an estimate for groundwater discharge to Bewbush Brook at the Site.

Table 2.3 Estimate of groundwater flow from development area to Bewbush Brook

Parameter	Value	Unit	Comment
Hydraulic gradient	0.029	-	Campbell Reith (2016b) measurement on 9 May 2017
Hydraulic conductivity	1.0×10^{-8}	m/s	Estimate for hydraulic conductivity of largely cohesive material present on Site
Length of Bewbush Brook	700	m	Length of Bewbush Brook within Site
Saturated thickness	7	m	Campbell Reith (2016b)
Flow ($Q = KiA$)	1.4×10^{-6}	m ³ /s	

2.6 Proposed soil stabilisation

According to Campbell Reith (2016a), parts of the Site will be subject to cutting and filling. In areas of proposed cutting, excavation of Made Ground to 2m below proposed earthworks levels is to be undertaken. In areas at grade or proposed fill a minimum of 1 m excavation below existing level is required, but increased to ensure a minimum of 3 m of Engineered Fill is placed below final formation level. The upper 2 m of engineered fill will have a minimum permeability of 1×10^{-7} m/s

to provide a low permeability layer.

In order to work the material for filling it is currently being conditioned with lime in order to control the moisture content. Permission to utilise CKD is being sought as an alternative to lime under a Waste Recovery Permit.

CKD is an alkaline material and treatment of soils with CKD will result in increased pH of the soil. The amount by which pH will be increased will depend on the original pH of the soil and the proportion of CKD mixed in to provide stabilisation. Heavy metals become insoluble and precipitate out of solution under alkaline conditions. Thus, whilst CKD's primary use on this project may be to reduce water content, it is likely to have the added beneficial effect of reducing the concentrations of any heavy metals present in the soils. A review of CKD literature has been undertaken to determine the likely effect of conditioning soils with CKD.

2.7 Literature review of uses of CKD for reducing metal concentrations in waste water

Mackie & Walsh (2011) describe bench-scale experiments that were conducted to evaluate the treatment performance of calcium hydroxide (Ca(OH)_2) slurries generated using four different CKD samples compared to a control treatment with quicklime (CaO) in terms of reducing acidity and metals concentrations in acid mine drainage (AMD) samples taken from the effluent of a lead/zinc mine in Atlantic Canada. Results of the study showed that all of the CKD samples evaluated were capable of achieving greater than 97% removal of total zinc and iron.

Choon-Keun Park. (2000) describes the hydration and solidification of hazardous wastes containing heavy metals using modified cementitious materials. Three cementitious materials were used: ordinary portland cement (OPC), clinker [cement] kiln dust (CKD) modified OPC and quick setting agent (QSA) modified OPC. The high pH of the CKD modified cement reduced heavy metals leached from the waste.

Rahman et al. (2011) presents a literature review on cement kiln dust usage in soil and waste stabilization and an experimental investigation of CKD. The experimental results showed that the use of 34% CKD increased the pH of sludge to above 10, which fixed heavy metals and concentrations in treated material were found to be within acceptable international limits.

El Refaey (2017) describes an investigation in copper removal from an aqueous solution by CKD. The study concluded that CKD was effective in copper removal from aqueous solutions.

Waly et. Al. (2007) describe experimental work to assess the adsorption of heavy metals comprising cadmium, aluminium, cobalt and zinc using CKD. A series of batch experiments were undertaken which showed CKD to be effective in sorbing these heavy metals, particularly at pH's in the range of 5.5 to 8.

2.8 Soil concentrations with and without CKD stabilisation

Table 2.4 presents site specific leachate test results. Laboratory certificates are included in Appendix C. The first five rows are for samples that have been mixed with varying amounts of CKD; the proportion of CKD varies between 2% and 6% in order to achieve moisture contents of between 21 and 25% as given in the table. The remaining five rows are for samples of site soil that have not been mixed with CKD. Note that the samples mixed with CKD were analysed by ESG Limited (ESG) whilst the samples not mixed with CKD were analysed by QTS Environmental Limited (QTS). It is understood that both sets are based on the NRA leaching test which uses a liquid:solid ratio of 10:1. However, we note that the laboratory detection limits applied for the two sets of data are different with the ESG data having a lower detection limit. In Table 2.4 the results are

compared against the UK drinking water standards (DWS) and results that exceed are highlighted in pink.

The results for the soils that are not mixed with CKD show no concentrations in excess of the UK DWS. With the exception of copper, boron and zinc all results were below the laboratory level of detection.

The results for soils that have been mixed with CKD have a greater proportion of results that are higher than the UK DWS. Nickel, lead and arsenic have two results out of five that exceed the UK DWS whilst selenium has four out of five. At the bottom of Table 2.4 the ratio of the maximum concentration in soils mixed with CKD to the UK DWS is given. This shows that the exceedances of the UK DWS are very small.

If CKD was mobilising heavy metal concentrations, we might expect to see an increase in concentration with increase in CKD proportion. Whilst it could be argued that this is occurring for arsenic and selenium, the samples with the highest proportions of CKD for nickel and lead have lower concentrations than those with smaller proportions of CKD.

Overall, the increase in concentration in CKD conditioned soils is not considered to be significant and is likely to be the result of natural fluctuations in heavy metal concentrations in the soils rather than a systematic effect due to the presence of CKD.

Table 2.4 Leachate test results

LAB ID Number	Client Sample Description	Sample Date	Nickel as Ni (Dissolved)	Chromium as Cr (Dissolved)	Cadmium as Cd (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Zinc ¹ as Zn (Dissolved)	Arsenic as As (Dissolved)	Boron as B (Dissolved) a	Mercury as Hg (Dissolved)	Selenium as Se (Dissolved)	Chromium VI as Cr
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
		ESG LOD	0.001	0.001	0.0001	0.001	0.001	0.002	0.001	0.01	0.0001	0.001	0.003
		QTSE LOD	0.005	0.005	0.0004	0.005	0.005	0.002	0.005	0.005	0.00005	0.005	0.02
1832982	24672336 - 25% MC S 1	05/Oct/2017	0.011	0.019	<0.0001	0.084	<0.001	0.010	0.015	0.020	<0.0001	0.041	0.019
1832983	24672340 - 24% MC S 2	05/Oct/2017	0.018	0.029	<0.0001	0.146	<0.001	0.008	0.015	<0.01	<0.0001	0.041	0.029
1832984	24672344 - 23% MC S 3	05/Oct/2017	0.022	0.016	<0.0001	0.122	0.012	0.034	0.005	<0.01	<0.0001	0.016	0.012
1832985	24672348 - 22% MC S 4	05/Oct/2017	0.013	0.008	<0.0001	0.069	<0.001	0.011	0.010	<0.01	<0.0001	0.016	0.007
1832986	24672352 - 21% MC S 5	05/Oct/2017	0.026	0.011	<0.0001	0.101	0.015	0.072	0.004	<0.01	<0.0001	0.010	0.006
17-65736	No CKD Soil Sample 1	13/Oct/2017	<0.005	<0.005	<0.0004	0.006	<0.005	<0.002	<0.005	0.097	<0.00005	<0.005	<0.02
17-65736	No CKD Soil Sample 2	13/Oct/2017	<0.005	<0.005	<0.0004	0.006	<0.005	<0.002	<0.005	0.078	<0.00005	<0.005	<0.02

LAB ID Number	Client Sample Description	Sample Date	Nickel as Ni (Dissolved)	Chromium as Cr (Dissolved)	Cadmium as Cd (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Zinc ¹ as Zn (Dissolved)	Arsenic as As (Dissolved)	Boron as B (Dissolved) a	Mercury as Hg (Dissolved)	Selenium as Se (Dissolved)	Chromium VI as Cr	
			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
17-65736	No CKD Soil Sample 3	13/Oct/2017	<0.005	<0.005	<0.0004	0.009	<0.005	<0.002	<0.005	0.075	<0.00005	<0.005	<0.02	
17-65736	No CKD Soil Sample 4	13/Oct/2017	<0.005	<0.005	<0.0004	0.007	<0.005	<0.002	<0.005	0.090	<0.00005	<0.005	<0.02	
17-65736	No CKD Soil Sample 5	13/Oct/2017	<0.005	<0.005	<0.0004	0.009	<0.005	0.003	<0.005	0.069	<0.00005	<0.005	<0.02	
Ratio of max result to EQS for soils mixed with CKD			UK DWS	0.02	0.05	0.05	2	0.01	5	0.01	1	0.001	0.01	-
			EQS	0.02		8x10⁻⁵	0.001	0.0072	0.008	0.05	-	5x10⁻⁵	-	0.0034
				1.3	-	-	-	2.1	-	0.3	-	-	4.1	-

Notes: cells highlighted in pink exceed UKDWS, zinc UKDWS is taken from Water Supply (Water Quality) Regulations 1989. All other UKDWS taken from Water Supply (Water Quality) Regulations 2000. EQS values are annual average EQS. Selenium ratio based on UK DWS as not EQS available.

3 Conceptual site model

An understanding of the key physical components of a soil and groundwater system must be accomplished prior to undertaking any risk assessment for controlled waters. To simplify the complexity of observed soil and groundwater conditions and to identify the relevant flow and transport parameters, a conceptual site model has been prepared for the Site. The model accounts for both the physical ground conditions (including surface and subsurface conditions, natural geology and made ground) and the key hydrological inputs and outputs to and from the system.

The environmental site setting description and data presented in the previous sections have been conceptualised into a set of potential source, pathway, receptor (S-P-R) linkages. These are described in this section, for the assessment of risk to controlled waters from the soils that are to be conditioned with CKD.

A set of guidelines for the assessment and management of environmental risk which presents a common framework for risk assessment as a key part of the process of appraisal for environmental decision-making is presented by DEFRA (2011) which provides guidelines for the development of S-P-R conceptual models.

Environment Agency guidance follows the same S-P-R principles for the assessment of risk to identified receptors. Environment Agency guidance (Environment Agency, 2010) has been withdrawn and replaced with "Landfill Developments: groundwater risk assessment for leachate" contained within the .gov.uk website.

Campbell Reith (2016a) presents a leachate and groundwater assessment. This assessment concludes that although elevated concentrations of some determinands were detected within groundwater associated with the Made Ground (Holmbush Landfill), this has not had any measurable impact on Hoppers Brook or Bewbush Brook. The Construction and Environmental Monitoring Plan (Dunton, 2017) includes requirements for surface water monitoring, which includes Bewbush Brook.

The conceptual model presented in this report solely relates to any increased risk from the mobilisation of contaminants due to the conditioning of the soils by CKD or from contamination present within the CKD itself i.e. whether the act of conditioning soils with CKD may result in an increased risk to identified receptors.

3.1 Water balance

Rainfall to the Site will seep into the ground and act to leach any contaminants present within the soil. Under conditions of intense rainfall or when the soil is saturated, surface run-off may occur. In areas of the Site covered by buildings or hardstanding with drainage, rainwater infiltration will be significantly reduced. Drainage at the Site is routed to attenuation ponds with discharge to Bewbush Brook. Water infiltration will be greatest in gardens and areas of soft landscaping. A proportion of this rainfall will be lost to evaporation and transpiration by plants (jointly referred to here as evapotranspiration). The balance of water will migrate downwards through the soil cover to the underlying low permeability fill material. Where the downwards flux of water exceeds the permeability of the low permeability layer, a saturated zone will form above the geological barrier which may need to be removed via soil drainage. The balance of water will continue downwards through the soil zone until it reaches groundwater. Given the permeability test data for the low permeability data as presented in Section 2.5, it is expected that the proportion of rainfall that infiltrates to groundwater will be quite small.

3.2 Source of contamination

The source of contamination is taken to be contaminants present within the stabilised soils that contain a proportion of CKD or from within the CKD itself. A literature review of CKD has been undertaken (Section 2.7) and this shows that it is used to chemically stabilise soils and sludges. The elevated pH of CKD tends to reduce heavy metal solubility and this will tend to act against increasing heavy metal concentrations in the pore water present within these soils. Laboratory leaching test data presented in Section 2.8 also suggests that there is no significant increase in heavy metal concentrations as a function of conditioning the soils with CKD.

3.3 Potential receptors

The solid geology beneath the Site is the Weald Clay which is a non-aquifer. Whilst pockets of groundwater have been observed within it, they are unlikely to be well connected and thus the opportunity for advective flow within the Weald Clay is very small. Groundwater may be present within the overlying Made Ground, much of which comprises landfill material associated with Holmbush Landfill or re-worked Site material used to bring levels up to the design level to form the development platform. The limited saturated thickness and permeability of such material limits its ability to support baseflow contribution to surface waters and it is extremely unlikely that it will ever be developed as a groundwater resource. Thus, it is considered that there is no viable pathway via groundwater.

Bewbush Brook flows through the Site and Spruce Hill Brook flows to the east of the Site whilst Hoppers Brook flows to the west. These represent potential receptors for this assessment.

3.4 Pathways

Pathways between the source (CKD conditioned soil) and Bewbush Brook, Spruce Hill Brook or Hoppers Brook are limited to either surface water runoff or via shallow groundwater flow within Made Ground deposits.

Spruce Hill Brook and Hoppers Brook are remote from the Site and it is unlikely that an overland flow pathway would extend to these water bodies. It is also unlikely that houses will be constructed immediately adjacent to Bewbush Brook as the Brook will run in an incised channel. Furthermore, surface water runoff will be directed to the Site drainage and discharged to Bewbush Brook in a managed manner without coming into contact with any CKD conditioned soils.

Thus, the only remaining pathway is via shallow groundwater flow within the Made Ground to Bewbush Brook.

Any contaminants released from the CKD conditioned soils would be subject to dilution within any groundwater present and further dilution within Bewbush Brook. An estimate of Bewbush Brook flow is made in Section 2.4 and an estimate of shallow Made Ground groundwater flow is made in Section 2.5. The dilution afforded by Bewbush Brook can be estimated as follows.

$$\text{Dilution Factor} = \frac{\text{Bewbush Brook Flow} + \text{Groundwater Discharge}}{\text{Groundwater Discharge}}$$

This equates to a dilution factor of 258. During wet periods, flow in Bewbush Brook is likely to be higher than estimated in Section 2.4 and it will be augmented by discharge from Site drainage resulting in a higher dilution factor. Conversely, during dry periods it may be lower.

4 Qualitative risk assessment

On the basis of the conceptual site model defined above, a qualitative risk assessment has been undertaken. The risk is defined in terms of the sensitivity of the receptors and the magnitude of any impact. These terms are further defined below.

4.1 Definitions

4.1.1 Receptor sensitivity

The sensitivity of a receptor refers to its importance, i.e. its environmental value / attributes. This may include a feature's level of statutory designation, such as whether an aquifer is designated as a principal or secondary aquifer.

The sensitivity of receptors is based on the relative importance of the receptor using the scale in Table 4.1.

Table 4.1 Sensitivity of Receptors

Sensitivity	Example
Very High	SSSI or Aquatic Natura 2000 site; Wetland watercourse habitat of particular ecological importance; Highly vulnerable groundwater such as a principal aquifer;
High	Wetland watercourse habitat of lesser ecological importance; Highly vulnerable groundwater such as a secondary aquifer; Significant peat deposits.
Medium	Wetland watercourse habitat; Moderately vulnerable groundwater.
Low	Low vulnerability groundwater; Superficial peat deposits.
Not Sensitive	No aquatic habitats or watercourses present; No significant groundwater present.

4.1.2 Determining Impact Magnitude

Impact magnitude is determined by predicting the scale of any potential change in the baseline conditions. Where possible magnitude is quantified; however, where this is not possible a fully defined qualitative assessment has been undertaken. The assessment of magnitude is carried out considering any 'design mitigation', i.e. relevant design features, in the proposal forming part of the development description. This may result in the need for 'additional mitigation' i.e. that which results from the risk assessment process, to reduce impacts further. Therefore, the magnitude of impacts both before and after 'additional mitigation' are considered.

Magnitude is assigned to the identified receptors as described in Table 4.2.

Table 4.2 Magnitude of Impacts

Sensitivity	Example
Substantial	Total loss of, or alteration to, key features of the baseline resource such that post-development characteristics or quality would be fundamentally and irreversibly changed, e.g. watercourse realignment

Sensitivity	Example
Moderate	Total loss of, or alteration to, key features of the baseline resource such that post-development characteristics or quality would be partially changed, e.g. in-stream permanent bridge works
Slight	Small changes to the baseline resource which are detectable but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions, e.g. culverting of very small watercourses
Negligible	A very slight change from baseline conditions, which is barely distinguishable and approximates to the 'no change' situation, e.g. short-term compaction from plant movements

4.1.3 Determining Significance and Nature of Effects

The significance of effect is determined by combining the magnitude of impact with the sensitivity of the receptor.

Each effect has a source originating from the development, a pathway and a receptor. Table 4.3 shows how the interaction of magnitude and sensitivity determine the significance of an environmental effect.

Table 4.3 Example Significance of Effects Matrix

		Magnitude of Impact			
		Substantial magnitude	Moderate magnitude	Slight magnitude	Negligible magnitude
Sensitivity of Receptor	Very High	Major	Major	Major/ Intermediate	Neutral
	High	Major	Major/ Intermediate	Intermediate/ Minor	Neutral
	Medium	Major	Intermediate	Minor	Neutral
	Low	Intermediate/ Minor	Minor	Neutral	Neutral

4.2 Preliminary risk assessment

On the basis of the data presented in this report and the conceptual model defined, the Qualitative Risk Assessment is presented in Table 4.4.

Table 4.4 Qualitative Risk Assessment

Source-pathway-receptor linkage	Receptor sensitivity	Magnitude	Significance of effect	Comment
CKD conditioned soils via shallow groundwater flow within Made Ground to Bewbush Brook	High	Negligible	Neutral	<p>Baseline quality of surface water is high and deterioration of such quality must be avoided to avoid damage to flora and fauna.</p> <p>Source concentrations in CKD conditioned soils are not significantly elevated compared to unconditioned soils.</p> <p>Dilution of concentrations will occur within groundwater pathway and / or within the Brook. The amount of dilution required to reduce concentrations below UK DWS / EQS is small. Flow estimates suggest sufficient dilution will be available.</p> <p>Monitoring of Bewbush Brook should continue as per the Construction Environmental Monitoring Plan (Dunton, 2017) to confirm no impact from materials conditioned with CKD. Additional determinands; sulphate, potassium and heavy metals will be added to the monitoring suite to confirm this risk assessment.</p>

5 Conclusions

Crest Nicholson is currently developing housing at a site at Kilnwood Vale on the outskirts of Crawley. Dunton Environmental is the Contractor constructing the development platform. Dunton Environmental is currently conditioning the soils using lime in order to manage the moisture content and is exploring the option of using CKD as an alternative to lime. CKD is a waste product from the manufacture of cement and, as such, Dunton Environmental, will require an Environmental Permit in order to mix CKD into soils. A HRA is required in order to support an application for an Environmental Permit.

An assessment of the geological and hydrogeological conditions shows that the Site is not located within a sensitive groundwater environment. The solid geology at the Site comprises Weald Clay which is a non-aquifer. Made Ground associated with the Holmbush Landfill extends across most of the Site. Alluvial deposits are associated with Bewbush Brook and other surface water bodies.

Bewbush Brook flows through the Site. It is assumed that there is a source, pathway, receptor linkage between the CKD conditioned soils and Bewbush Brook via shallow groundwater flow within the Made Ground.

A literature review for CKD has been undertaken. CKD is characterised by high pH (alkaline conditions) and this is used in waste water treatment to immobilise heavy metals. Heavy metals tend to be insoluble under alkaline conditions. Limited leaching test data are also available which show no significant increase in heavy metal concentrations in samples conditioned with CKD compared to original soils.

On the basis of this information, a qualitative risk assessment has been undertaken for Bewbush Brook. This concludes that there is likely to be a negligible impact on Brook water quality due to available dilution in the receiving water from the use of CKD conditioned soils and therefore no mitigation measures are required other than continued monitoring of water quality in Bewbush Brook for a range of determinands possibly to be found in CKD.

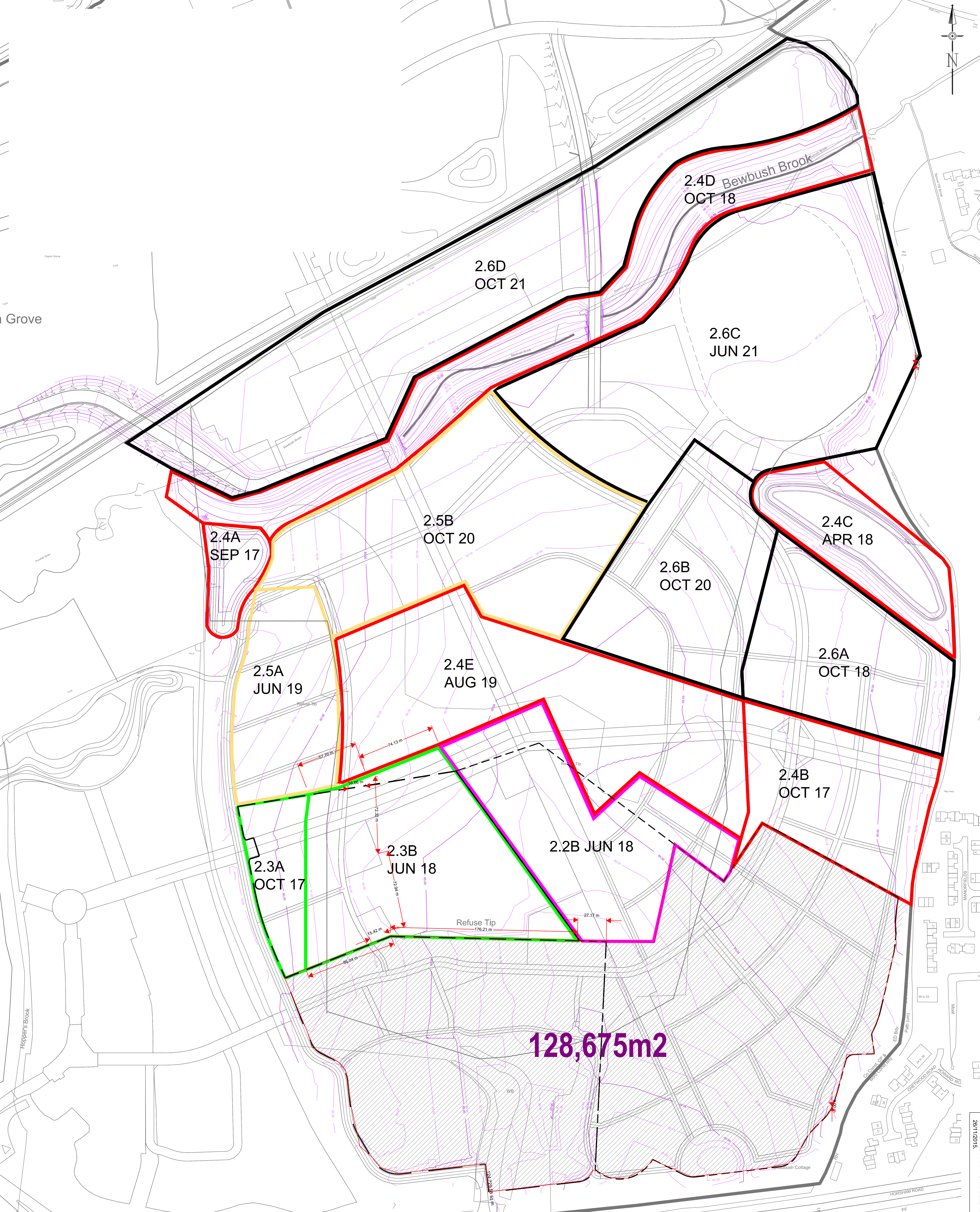
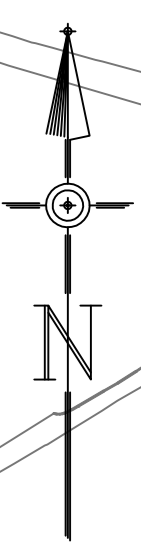
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APPENDICES

Appendix A

Drawing DTR15549 – Remaining Areas Plan - KV



2.4D Bewbush Brook
OCT 18

2.6D
OCT 21

2.6C
JUN 21

2.4A
SEP 17

2.5B
OCT 20

2.4C
APR 18

2.6B
OCT 20

2.5A
JUN 19

2.4E
AUG 19

2.6A
OCT 18

2.4B
OCT 17

2.2B JUN 18

2.3A
OCT 17

2.3B
JUN 18

Refuse Tip
176.21 m

128,675m²

Appendix B

Permeability test results

CET Infrastructure
Northdown House
Harrietsham
Maidstone
Kent
ME17 1QW

Date: 30 March 2017
Test Report Ref: STR 516879

Order No: 926132/K2

Page 1 of 3

Contract: Kilnwood Vale - Compaction Trials

LABORATORY TEST REPORT

TEST REQUIREMENTS:

To determine the Coefficient of Permeability in a Triaxial Cell Using the Accelerated Permeability Test in accordance with
R & D Technical Report P1-398/TR/2

SAMPLE DETAILS:

Certificate of sampling received:	No
Laboratory Ref. No:	S63992
Client Ref. No:	170558 (14987)
Date and Time of Sampling:	13/03/2017
Date of Receipt at Lab:	17/03/2017
Date of Start of Test:	22/03/2017
Sampling Location:	Panel 2 Layer 2
Name of Source:	Site Won
Method of Sampling:	Disturbed Bulk Sample
Sampled By:	Client
Material Description:	Dark brown gravelly clay with lime
Target Specification:	N/A

RESULTS:

See attached

Comments: None	Report checked and approved by:  Meical Owen Soils Team Manager
--------------------------	---

TEST RESULTS

Sample condition: **Undisturbed/Remoulded**
(Delete as appropriate)

Method of Remoulding (If applicable): **2.5kg rammer/~~4.5kg rammer~~**
(Delete as appropriate)

Specimen Details:	Initial:	Final:
Diameter:	101.8 mm	101 mm
Height:	98.6 mm	97.4 mm
Moisture content:	25.2 %	24.3 %
Bulk density:	1.970 Mg/m ³	2.007 Mg/m ³
Dry density:	1.573 Mg/m ³	1.615 Mg/m ³
Air voids:	2.1 %	
Particle density:	2.70 Mg/m ³	(Found / Assumed)

Permeability stage:

Pressure difference across specimen: **125 kPa**
 Mean effective stress: **187.5 kPa**
 Final pore pressure coefficient, B: **1.00**
 Duration of stage **6 days**
Coefficient of Permeability (k_v) at 20°C = 5.0 x 10⁻¹¹ m/s

Routine apparatus checks:

	Pressure (kPa)	Time under pressure (HH:MM)	Volume change (ml)	Permitted difference (ml)
Back pressure system / top cap	750	16:00	0.00	<0.1
Back pressure system / bottom cap	750	16:00	0.00	<0.1

	Pressure (kPa)	Time under pressure (HH:MM)	Pressure change (kPa)	Permitted difference (kPa)
Cell pressure / pore pressure system	700	16:00	0.2	<1kPa

CET Infrastructure
Northdown House
Harrietsham
Maidstone
Kent
ME17 1QW

Date: 30 March 2017
Test Report Ref: STR 516878

Order No: 926132/K2

Page 1 of 3

Contract: Kilnwood Vale - Compaction Trials

LABORATORY TEST REPORT

TEST REQUIREMENTS:

To determine the Coefficient of Permeability in a Triaxial Cell Using the Accelerated Permeability Test in accordance with
R & D Technical Report P1-398/TR/2

SAMPLE DETAILS:

Certificate of sampling received:	No
Laboratory Ref. No:	S63992
Client Ref. No:	170557 (14988)
Date and Time of Sampling:	13/03/2017
Date of Receipt at Lab:	17/03/2017
Date of Start of Test:	22/03/2017
Sampling Location:	Panel 1 Layer 2
Name of Source:	Site Won
Method of Sampling:	Disturbed Bulk Sample
Sampled By:	Client
Material Description:	Dark brown gravelly clay with lime
Target Specification:	N/A

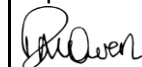
RESULTS:

See attached

Comments:

None

Report checked and approved by:



Meical Owen
Soils Team Manager

TEST RESULTS

Sample condition: **Undisturbed/Remoulded**
(Delete as appropriate)

Method of Remoulding (If applicable): **2.5kg rammer/4.5kg rammer**
(Delete as appropriate)

Specimen Details:	Initial:	Final:
Diameter:	101.8 mm	101.5 mm
Height:	98.6 mm	98.3 mm
Moisture content:	24.1 %	23.9 %
Bulk density:	1.996 Mg/m ³	2.010 Mg/m ³
Dry density:	1.608 Mg/m ³	1.622 Mg/m ³
Air voids:	1.7 %	
Particle density:	2.70 Mg/m ³	(Found / Assumed)

Permeability stage:

Pressure difference across specimen: **125 kPa**
 Mean effective stress: **187.5 kPa**
 Final pore pressure coefficient, B: **1.00**
 Duration of stage **6 days**
Coefficient of Permeability (k_v) at 20°C = 4.0 x 10⁻¹¹ m/s

Routine apparatus checks:

	Pressure (kPa)	Time under pressure (HH:MM)	Volume change (ml)	Permitted difference (ml)
Back pressure system / top cap	750	16:00	0.00	<0.1
Back pressure system / bottom cap	750	16:00	0.00	<0.1

	Pressure (kPa)	Time under pressure (HH:MM)	Pressure change (kPa)	Permitted difference (kPa)
Cell pressure / pore pressure system	700	16:00	0.1	<1kPa

CET Infrastructure
Northdown House
Harrietsham
Maidstone
Kent
ME17 1QW

Date: 30 March 2017
Test Report Ref: STR 516880

Order No: 926133/K2

Page 1 of 3

Contract: Kilnwood Vale - Compaction Trials

LABORATORY TEST REPORT

TEST REQUIREMENTS:

To determine the Coefficient of Permeability in a Triaxial Cell Using the Accelerated Permeability Test in accordance with
R & D Technical Report P1-398/TR/2

SAMPLE DETAILS:

Certificate of sampling received:	No
Laboratory Ref. No:	S63994
Client Ref. No:	170562 (15123)
Date and Time of Sampling:	14/03/2017
Date of Receipt at Lab:	17/03/2017
Date of Start of Test:	22/03/2017
Sampling Location:	Panel 2 Layer 3
Name of Source:	Site Won
Method of Sampling:	Disturbed Bulk Sample
Sampled By:	Client
Material Description:	Dark Brown gravelly clay with lime
Target Specification:	N/A

RESULTS:

See attached

Comments: None	Report checked and approved by:  Meical Owen Soils Team Manager
--------------------------	---

TEST RESULTS

Sample condition: **Undisturbed/Remoulded**
(Delete as appropriate)

Method of Remoulding (If applicable): **2.5kg rammer/4.5kg rammer**
(Delete as appropriate)

Specimen Details:	Initial:	Final:
Diameter:	101.8 mm	101.6 mm
Height:	98.6 mm	98.9 mm
Moisture content:	20.4 %	20.8 %
Bulk density:	2.046 Mg/m ³	2.054 Mg/m ³
Dry density:	1.699 Mg/m ³	1.7 Mg/m ³
Air voids:	2.4 %	
Particle density:	2.70 Mg/m ³	(Found / Assumed)

Permeability stage:

Pressure difference across specimen: **125 kPa**
 Mean effective stress: **187.5 kPa**
 Final pore pressure coefficient, B: **0.96**
 Duration of stage **5 days**
Coefficient of Permeability (k_v) at 20°C = 5.9 x 10⁻¹⁰ m/s

Routine apparatus checks:

	Pressure (kPa)	Time under pressure (HH:MM)	Volume change (ml)	Permitted difference (ml)
Back pressure system / top cap	750	16:00	0.00	<0.1
Back pressure system / bottom cap	750	16:00	0.00	<0.1

	Pressure (kPa)	Time under pressure (HH:MM)	Pressure change (kPa)	Permitted difference (kPa)
Cell pressure / pore pressure system	700	16:00	0.2	<1kPa

CET Infrastructure
Northdown House
Harrietsham
Maidstone
Kent
ME17 1QW

Date: 30 March 2017
Test Report Ref: STR 516881

Order No: 926133/K2

Page 1 of 3

Contract: Kilnwood Vale - Compaction Trials

LABORATORY TEST REPORT

TEST REQUIREMENTS:

To determine the Coefficient of Permeability in a Triaxial Cell Using the Accelerated Permeability Test in accordance with
R & D Technical Report P1-398/TR/2

SAMPLE DETAILS:

Certificate of sampling received:	No
Laboratory Ref. No:	S63994
Client Ref. No:	170563 (15127)
Date and Time of Sampling:	14/03/2017
Date of Receipt at Lab:	17/03/2017
Date of Start of Test:	22/03/2017
Sampling Location:	Panel 1 Layer 3
Name of Source:	Site Won
Method of Sampling:	Disturbed Bulk Sample
Sampled By:	Client
Material Description:	Dark Brown gravelly clay with lime
Target Specification:	N/A

RESULTS:

See attached

Comments: None	Report checked and approved by:  Meical Owen Soils Team Manager
--------------------------	---

TEST RESULTS

Sample condition: **Undisturbed/Remoulded**
(Delete as appropriate)

Method of Remoulding (If applicable): **2.5kg rammer/~~4.5kg rammer~~**
(Delete as appropriate)

Specimen Details:	Initial:	Final:
Diameter:	101.8 mm	101.6 mm
Height:	98.6 mm	98.9 mm
Moisture content:	22.2 %	22.5 %
Bulk density:	2.023 Mg/m ³	2.029 Mg/m ³
Dry density:	1.655 Mg/m ³	1.656 Mg/m ³
Air voids:	2.0 %	
Particle density:	2.70 Mg/m ³	(Found / Assumed)

Permeability stage:

Pressure difference across specimen: **125 kPa**
 Mean effective stress: **187.5 kPa**
 Final pore pressure coefficient, B: **0.96**
 Duration of stage **6 days**
Coefficient of Permeability (k_v) at 20°C = 3.3 x 10⁻¹⁰ m/s

Routine apparatus checks:

	Pressure (kPa)	Time under pressure (HH:MM)	Volume change (ml)	Permitted difference (ml)
Back pressure system / top cap	750	16:00	0.00	<0.1
Back pressure system / bottom cap	750	16:00	0.00	<0.1

	Pressure (kPa)	Time under pressure (HH:MM)	Pressure change (kPa)	Permitted difference (kPa)
Cell pressure / pore pressure system	700	16:00	0	<1kPa

Henwood Pavilion
Henwood
Ashford
Kent
TN24 8DH

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Dunton Environmental Ltd
Unit 1, Tamebridge Industrial Estate
Aldridge Road, Perry Barr
Birmingham
B42 2TX
Fao: Vukan Andjelkovic/John Harrison

5th July 2017

Our Ref: 17629/LRpt2

Dear Sirs

**Kilnwood Vale, Faygate, RH12 4SE –
Letter Report on Soakage Test Results –Panels SW2.4B-1 and SW2.4B-2**

We write to present the findings from two soakage tests, carried out in area 2.4B, on 30th June 2017. The weather was dry and overcast, with some sunny spells in the afternoon.

Introduction

It is understood that these soakage tests were required within compaction panels, in order to check that their permeabilities met specification. A permeability equal to or less than 10^{-7} m/s has been specified, thus minimal soakage was anticipated during these tests.

Methodology

The position of the two soakage test pits (SW2.4B-1 and SW2.4B-2) were set out by Dunton Environmental Ltd, with SW2.4B-1 located within bay 10-2, and SW2.4B-2 located just to the north of SW2.4B-1, within bay 4. Both of these pits were excavated in Class 2C material. The two pits were excavated by Dunton Environmental, using a mechanical excavator with a toothed bucket, and were then trimmed by hand, to give vertical sides and a flat horizontal base. The dimensions of the pits were recorded by Gabriel GeoConsulting (GGC), and the data loggers were set up within the pits, prior to being filled with water. For further details of the testing methodology and the data loggers used, reference should be made to our previous Letter Report on Soakage Tests (Ref: 17629/LRpt1, 30th June 2017). Both of these soakage tests were partially observed by two members of staff from Campbell Reith.

Results

The results from the data-loggers in SW2.4B-1 and SW2.4B-2 are presented in the attached Figures SW2.4B-1 and SW2.4B-2 respectively, as graphs of pressure, water level (as depth below ground level), and temperature with respect to time. Both graphs illustrate very minimal to no soakage over the duration of the test. The soakage tests in SW2.4B-1 and SW2.4B-2 were aborted after a total of 217 minutes and 180 minutes respectively, due to a lack of any significant soakage.

The water levels did not fall to either the 75% or the 25% levels, as required for calculation of soakage rate in accordance with BRE Digest 365.

In order to calculate the permeability of the material within which the soakage tests were carried out, the following formula for a falling head test was used, from CIRIA Report 113, Appendix 4, Assessment of permeability from soakaway tests:

$$\frac{k}{l}(t_2 - t_1) = \log\left(\frac{h_1}{h_2}\right) - \log\left(\frac{\alpha h_1 + 1}{\alpha h_2 + 1}\right)$$

where $\alpha = \frac{P}{2A}$ and assuming $l \approx$ average head $\frac{(h_1 + h_2)}{2}$

$h_1 - h_2 =$ fall in water level in time interval $(t_2 - t_1)$

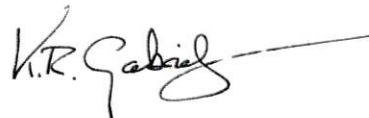
In SW2.4B-1 (excavated in bay 10-2), a permeability, $k = 2.8 \times 10^{-8}$ m/s was calculated (for the Class 2C material), and a permeability of $k = 7.9 \times 10^{-8}$ m/s was calculated in SW2.4B-2 (excavated in bay 4, which also consists of Class 2C material). These calculations are based on readings taken by the Divers at the beginning of the test (once the readings had stabilized after filling the pits with water), and just before the end of the test. Figures SW2.4B-1 and SW2.4B-2 show that a small amount of 'noise' was present within the data-logged readings; high h_1 readings and low h_2 readings were used in these calculations, so the calculated permeabilities are over-estimates.

We trust this letter meets your requirements. Please do call us if you need clarification of any aspect of these tests.

Yours faithfully



Alex Goodsell
BSc ACSM FGS
e: alexgoodsell@gabrielgeo.co.uk

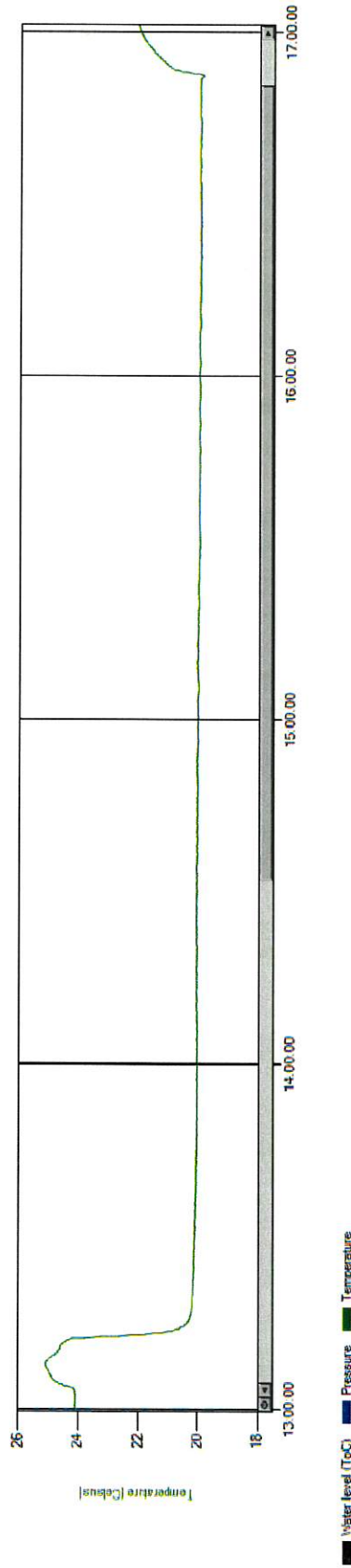
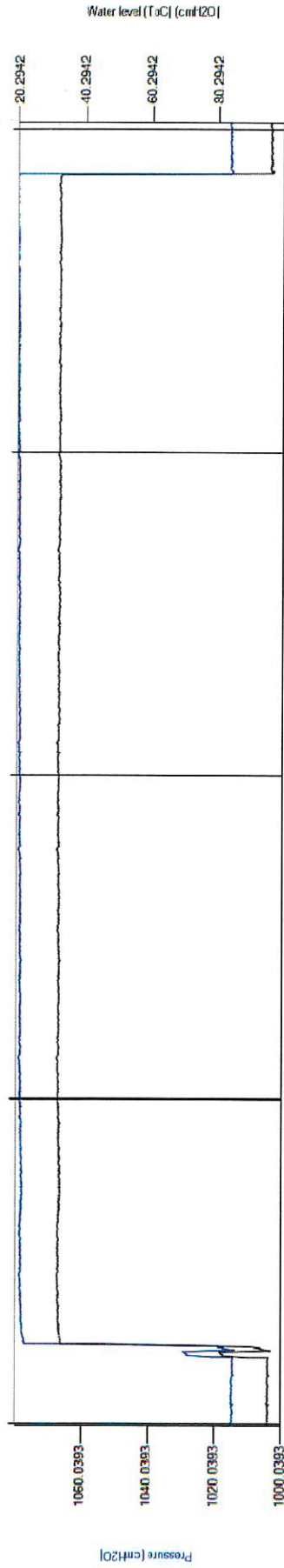


Keith Gabriel
MSc DIC CGeol FGS
UK Registered Ground Engineering Adviser
e: KeithG@gabrielgeo.co.uk

For and on behalf of **Gabriel GeoConsulting Ltd**

Encs: Figures SW2.4B-1 & SW2.4B-2

TRIAL PIT 1 - AD238 - [30/06/2017 10:27:15 - 30/06/2017 17:14:45]



Water level [ToC] Pressure Temperature

Project: Kilnwood Vale, Faygate, RH12 4SE

Title: TD Diver Results - Test Pit SW 2.4B-1

Figure: SW 2.4B-1

17629

Date: 30th June 2017

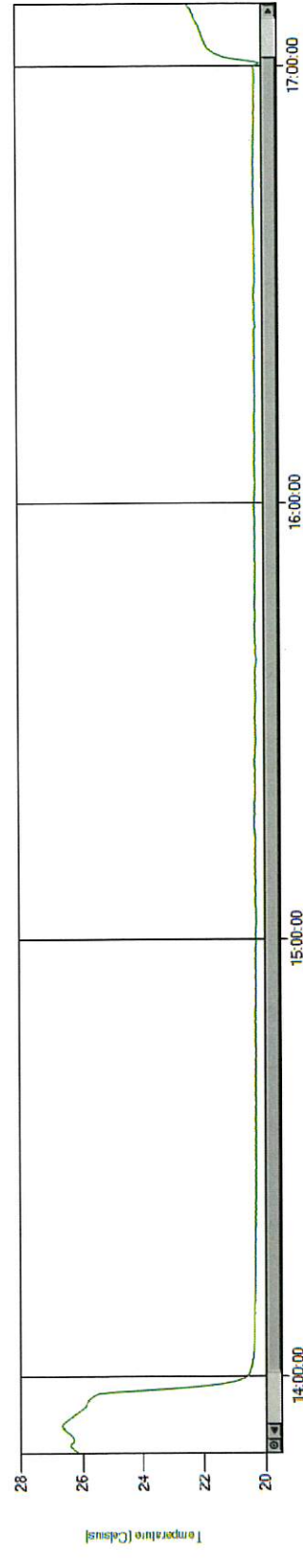
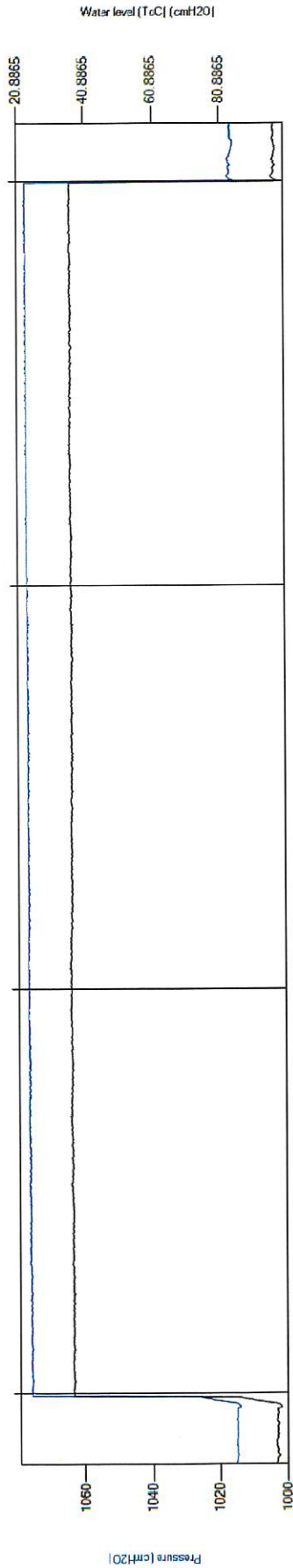
Checked: AG

Approved: KRG

Scale: NTS



TRIAL PIT 2 - AD287 - [30/06/2017 13:41:40 - 30/06/2017 17:14:10]



■ Water level (ToC) ■ Pressure ■ Temperature

Project: Kilnwood Vale, Faygate, RH12 4SE

Title: TD Diver Results - Test Pit SW 2.4B-2



Figure: SW 2.4B-2

Date: 30th June 2017

Scale: NTS

Approved: KRG

Checked: AG

Appendix C

Laboratory Leaching test results



Adrian Jefimiuk
Dunton Environmental Ltd
Unit 1
Tamebridge Industrial Estate
Perry Barr
Aldridge Road
B42 2TX

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-65736

Site Reference: Kilnwood Vale

Project / Job Ref: DTR16525

Order No: None Supplied

Sample Receipt Date: 17/10/2017

Sample Scheduled Date: 17/10/2017

Report Issue Number: 1

Reporting Date: 23/10/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Dave Ashworth
Deputy Quality Manager

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Leachate Analysis Certificate						
QTS Environmental Report No: 17-65736	Date Sampled	13/10/17	13/10/17	13/10/17	13/10/17	13/10/17
Dunton Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Kilnwood Vale	TP / BH No	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Project / Job Ref: DTR16525	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Reporting Date: 23/10/2017	QTSE Sample No	296574	296575	296576	296577	296578

Determinand	Unit	RL	Accreditation					
Arsenic	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Boron	ug/l	< 5	ISO17025	97	78	75	90	69
Cadmium	ug/l	< 0.4	ISO17025	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Chromium (hexavalent)	ug/l	< 20	NONE	< 20	< 20	< 20	< 20	< 20
Copper	ug/l	< 5	ISO17025	6	6	9	7	9
Lead	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Mercury	ug/l	< 0.05	ISO17025	< 0.05	< 0.05	0.06	< 0.05	< 0.05
Nickel	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Selenium	ug/l	< 5	ISO17025	< 5	< 5	< 5	< 5	< 5
Zinc	ug/l	< 2	ISO17025	< 2	< 2	< 2	< 2	3

Subcontracted analysis ⁽⁵⁾

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-65736
Dunton Environmental Ltd
Site Reference: Kilnwood Vale
Project / Job Ref: DTR16525
Order No: None Supplied
Reporting Date: 23/10/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

Our Ref: EXR/250175 (Ver. 1)

Your Ref: UXB0386661

October 11, 2017



Environmental Chemistry

ESG

Bretby Business Park

Ashby Road

Burton-on-Trent

Staffordshire

DE15 0YZ

Telephone: 01283 554400

Facsimile: 01283 554422

Adrian Jefimiuk
Dunton Environmental Limited
Unit 1 Tamebridge Industrial Estate
Aldridge Road
Perry Bar
Birmingham
B42 2TX

For the attention of Adrian Jefimiuk

Dear Adrian Jefimiuk

CEN Leachate 10:1 - Kilnwood Vale, Horsham

Samples from the above site have been analysed in accordance with the schedule supplied.
The sample details and the results of analyses for these samples are given in the appended report.

An invoice for this work will follow under a separate cover.

Please be aware that our policy for the retention of paper based laboratory records and analysis reports is 6 years.

The work was carried out in accordance with Environmental Scientifics Group Ltd (Multi-Sector Services) Standard Terms and Conditions of Contract.

If I can be of any further assistance please do not hesitate to contact me.

Yours sincerely

for ESG

A handwritten signature in black ink that reads 'P Williams' followed by a long, horizontal flourish.

P Williams
Project Co-ordinator
01283 554649

TEST REPORT



Report No. EXR/250175 (Ver. 1)

Dunton Environmental Limited
Unit 1 Tamebridge Industrial Estate
Aldridge Road
Perry Bar
Birmingham
B42 2TX

Site: Kilnwood Vale, Horsham

The 5 samples described in this report were registered for analysis by ESG on 05-Oct-2017. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 11-Oct-2017

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Page 2)
Analytical and Deviating Sample Overview (Page 3)
Table of Method Descriptions (Page 4)
Table of Report Notes (Page 5)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
ESG :
Tim Barnes

A handwritten signature in blue ink, appearing to read 'Tim Barnes'.

Operations Director
Energy & Waste Services

Date of Issue: 11-Oct-2017

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

ESG accepts no responsibility for any sampling not carried out by our personnel.

Where individual results are flagged see report notes for status.

Customer **Dunton Environmental Limited**
Site **Kilnwood Vale, Horsham**
Report No **W250175**

Consignment No S69469
Date Logged 05-Oct-2017
In-House Report Due 13-Oct-2017

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working

ID Number	Description	Matrix Type	MethodID	CUST/SERV	ICP/MS/UV	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Boron as B (Dissolved) VAR	Chromium VI. as Cr (Kone)	Leachate Prep
EX/1832982	24672336 - 25% MC	Laboratory Produced Leachate	05/10/17			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
EX/1832983	24672340 - 24% MC	Laboratory Produced Leachate	05/10/17														
EX/1832984	24672344 - 23% MC	Laboratory Produced Leachate	05/10/17														
EX/1832985	24672348 - 22% MC	Laboratory Produced Leachate	05/10/17														
EX/1832986	24672352 - 21% MC	Laboratory Produced Leachate	05/10/17														

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time
Requested Analysis Key	
■	Analysis Required
■	Analysis dependant upon trigger result - Note: due date may be affected if triggered
□	No analysis scheduled
^	Analysis Subcontracted - Note: due date may vary

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling. Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³@ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

P Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Appendix D

Bewbush water quality data



Vukan Andjelkovic
Dunton Environmental Ltd
Unit 1
Tamebridge Industrial Estate
Perry Barr
Aldridge Road
B42 2TX

QTS Environmental Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-57942

Site Reference: Kilnwood Vale, Phase 2.4

Project / Job Ref: DTR16525

Order No: None Supplied

Sample Receipt Date: 20/04/2017

Sample Scheduled Date: 20/04/2017

Report Issue Number: 1

Reporting Date: 26/04/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Dave Ashworth
Deputy Quality Manager

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410



Water Analysis Certificate					
QTS Environmental Report No: 17-57942	Date Sampled	17/04/17			
Dunton Environmental Ltd	Time Sampled	None Supplied			
Site Reference: Kilnwood Vale, Phase 2.4	TP / BH No	Sample 1 - Downstream			
Project / Job Ref: DTR16525	Additional Refs	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied			
Reporting Date: 26/04/2017	QTSE Sample No	264275			

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	ISO17025	7.9			
Electrical Conductivity	uS/cm	< 5	NONE	417			
Chloride	mg/l	< 1	ISO17025	44			
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	7.4			
Chemical Oxygen Demand	mg/l	< 5	NONE	13			
Biological Oxygen Demand	mg/l	< 5	NONE	< 5			
Total Suspended Solids	mg/l	< 5	NONE	43			
Calcium (dissolved)	mg/l	< 0.2	ISO17025	31			
Magnesium (dissolved)	mg/l	< 0.1	ISO17025	4.9			
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10			

Subcontracted analysis ^(S)

Insufficient sample ^{I/S}

Unsuitable Sample ^{U/S}



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Water Analysis Certificate - Speciated PAH			
QTS Environmental Report No: 17-57942	Date Sampled	17/04/17	
Dunton Environmental Ltd	Time Sampled	None Supplied	
Site Reference: Kilnwood Vale, Phase 2.4	TP / BH No	Sample 1 - Downstream	
Project / Job Ref: DTR16525	Additional Refs	None Supplied	
Order No: None Supplied	Depth (m)	None Supplied	
Reporting Date: 26/04/2017	QTSE Sample No	264275	

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	0.02			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	0.02			
Anthracene	ug/l	< 0.01	NONE	< 0.01			
Fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Pyrene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.05			

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-57942
Dunton Environmental Ltd
Site Reference: Kilnwood Vale, Phase 2.4
Project / Job Ref: DTR16525
Order No: None Supplied
Reporting Date: 26/04/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
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Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-61456

Site Reference: Kilnwood Vale 2.2B - 2.6

Project / Job Ref: DTR16525

Order No: None Supplied

Sample Receipt Date: 06/07/2017

Sample Scheduled Date: 12/07/2017

Report Issue Number: 1

Reporting Date: 18/07/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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Water Analysis Certificate					
QTS Environmental Report No: 17-61456	Date Sampled	05/07/17			
Dunton Environmental Ltd	Time Sampled	None Supplied			
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Sample 1			
Project / Job Ref: DTR16525	Additional Refs	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied			
Reporting Date: 18/07/2017	QTSE Sample No	279170			

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	ISO17025	7.3			
Electrical Conductivity	uS/cm	< 5	NONE	631			
Chloride	mg/l	< 1	ISO17025	68			
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	13.3			
Chemical Oxygen Demand	mg/l	< 5	NONE	26			
Biological Oxygen Demand	mg/l	< 5	NONE	13			
Total Suspended Solids	mg/l	< 5	NONE	96			
Calcium (dissolved)	mg/l	< 0.2	ISO17025	80.6			
Magnesium (dissolved)	mg/l	< 0.1	ISO17025	7.4			
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10			

Subcontracted analysis ^(S)

Insufficient sample ^{I/S}

Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Speciated PAH					
QTS Environmental Report No: 17-61456	Date Sampled	05/07/17			
Dunton Environmental Ltd	Time Sampled	None Supplied			
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Sample 1			
Project / Job Ref: DTR16525	Additional Refs	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied			
Reporting Date: 18/07/2017	QTSE Sample No	279170			

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	< 0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	0.06			
Anthracene	ug/l	< 0.01	NONE	0.01			
Fluoranthene	ug/l	< 0.01	NONE	0.11			
Pyrene	ug/l	< 0.01	NONE	0.08			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	0.008	NONE	< 0.008			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.26			

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-61456
Dunton Environmental Ltd
Site Reference: Kilnwood Vale 2.2B - 2.6
Project / Job Ref: DTR16525
Order No: None Supplied
Reporting Date: 18/07/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-64875

Site Reference: Kilnwood Vale 2.2B - 2.6

Project / Job Ref: DTR 16525

Order No: None Supplied

Sample Receipt Date: 27/09/2017

Sample Scheduled Date: 28/09/2017

Report Issue Number: 1

Reporting Date: 04/10/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Russell Jarvis
Associate Director of Client Services

QTSE is the trading name of DETS Ltd, company registration number 03705645



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Water Analysis Certificate					
QTS Environmental Report No: 17-64875	Date Sampled	22/09/17			
Dunton Environmental Ltd	Time Sampled	None Supplied			
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Stream 01			
Project / Job Ref: DTR 16525	Additional Refs	Bewbush Brook			
Order No: None Supplied	Depth (m)	None Supplied			
Reporting Date: 04/10/2017	QTSE Sample No	292956			

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	ISO17025	7.6			
Electrical Conductivity	uS/cm	< 5	NONE	504			
Chloride	mg/l	< 1	ISO17025	45			
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	61			
Chemical Oxygen Demand	mg/l	< 5	NONE	19			
Biological Oxygen Demand	mg/l	< 5	NONE	23			
Total Suspended Solids	mg/l	< 5	NONE	5			
Calcium (dissolved)	mg/l	< 0.2	ISO17025	52.5			
Magnesium (dissolved)	mg/l	< 0.1	ISO17025	4.8			
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10			

Subcontracted analysis ^(S)

Insufficient sample ^{I/S}

Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Speciated PAH			
QTS Environmental Report No: 17-64875	Date Sampled	22/09/17	
Dunton Environmental Ltd	Time Sampled	None Supplied	
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Stream 01	
Project / Job Ref: DTR 16525	Additional Refs	Bewbush Brook	
Order No: None Supplied	Depth (m)	None Supplied	
Reporting Date: 04/10/2017	QTSE Sample No	292956	

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	0.02			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	< 0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	0.03			
Anthracene	ug/l	< 0.01	NONE	< 0.01			
Fluoranthene	ug/l	< 0.01	NONE	0.02			
Pyrene	ug/l	< 0.01	NONE	0.02			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	< 0.008	NONE	< 0.008			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.09			

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-64875
Dunton Environmental Ltd
Site Reference: Kilnwood Vale 2.2B - 2.6
Project / Job Ref: DTR 16525
Order No: None Supplied
Reporting Date: 04/10/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered



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QTS Environmental Report No: 17-66015

Site Reference: Kilnwood Vale 2.2B - 2.6

Project / Job Ref: DTR 16525

Order No: None Supplied

Sample Receipt Date: 20/10/2017

Sample Scheduled Date: 23/10/2017

Report Issue Number: 1

Reporting Date: 27/10/2017

Authorised by:

Kevin Old
Associate Director of Laboratory

Authorised by:

Dave Ashworth
Deputy Quality Manager

QTSE is the trading name of DETS Ltd, company registration number 03705645



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Water Analysis Certificate					
QTS Environmental Report No: 17-66015	Date Sampled	19/10/17			
Dunton Environmental Ltd	Time Sampled	None Supplied			
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Stream (Bewbush Brook)			
Project / Job Ref: DTR 16525	Additional Refs	None Supplied			
Order No: None Supplied	Depth (m)	None Supplied			
Reporting Date: 27/10/2017	QTSE Sample No	297561			

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	ISO17025	7.5			
Electrical Conductivity	uS/cm	< 5	NONE	480			
Chloride	mg/l	< 1	ISO17025	40			
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	7.5			
Chemical Oxygen Demand	mg/l	< 5	NONE	15			
Biological Oxygen Demand	mg/l	< 5	NONE	7			
Total Suspended Solids	mg/l	< 5	NONE	9			
Settleable Solids	mg/l	< 10	NONE	< 10			
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4			
Magnesium (dissolved)	mg/l	< 0.1	ISO17025	5.4			
Total Phenols (monohydric)	ug/l	< 10	NONE	< 10			

Subcontracted analysis ^(S)
 Insufficient sample ^{I/S}
 Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Speciated PAH			
QTS Environmental Report No: 17-66015	Date Sampled	19/10/17	
Dunton Environmental Ltd	Time Sampled	None Supplied	
Site Reference: Kilnwood Vale 2.2B - 2.6	TP / BH No	Stream (Bewbush Brook)	
Project / Job Ref: DTR 16525	Additional Refs	None Supplied	
Order No: None Supplied	Depth (m)	None Supplied	
Reporting Date: 27/10/2017	QTSE Sample No	297561	

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	0.02			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	< 0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	0.02			
Anthracene	ug/l	< 0.01	NONE	< 0.01			
Fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Pyrene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	0.008	NONE	< 0.008			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	0.04			

Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-66015
Dunton Environmental Ltd
Site Reference: Kilnwood Vale 2.2B - 2.6
Project / Job Ref: DTR 16525
Order No: None Supplied
Reporting Date: 27/10/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

Appendix I

Waste Classification Assessments



Adrian Jefimiuk
Dunton Environmental Ltd
Unit 1
Tamebridge Industrial Estate
Perry Barr
Aldridge Road
B42 2TX

QTS Environmental Ltd
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Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 17-59273

Site Reference: Head Office

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 22/05/2017

Sample Scheduled Date: 22/05/2017

Report Issue Number: 1

Reporting Date: 25/05/2017

Authorised by:

Russell Jarvis
Associate Director of Client Services

Authorised by:

Dave Ashworth
Deputy Quality Manager

QTSE is the trading name of DETS Ltd, company registration number 03705645



QTS Environmental Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
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Soil Analysis Certificate						
QTS Environmental Report No: 17-59273	Date Sampled	19/05/17	19/05/17	19/05/17	19/05/17	
Dunton Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Head Office	TP / BH No	Cement Kiln Dust Sample 1	Cement Kiln Dust Sample 2	Cement Kiln Dust Sample 3	Cement Kiln Dust Sample 4	
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 25/05/2017	QTSE Sample No	270033	270034	270035	270036	

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)
pH	pH Units	N/a	MCERTS	12.9	13.1	13.0	13.1
Alkali Reserve	g NaOH/100g	< 0.1	NONE	10.8	8.2	8.8	9.2
Arsenic (As)	mg/kg	< 2	MCERTS	30	28	31	31
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	24.7	24.3	25.2	24.7
Chromium (Cr)	mg/kg	< 2	MCERTS	39	37	40	38
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	MCERTS	59	58	62	57
Lead (Pb)	mg/kg	< 3	MCERTS	916	892	924	901
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	25	23	25	24
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	838	803	848	830

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

Analysis carried out on the dried sample is corrected for the stone content

Subcontracted analysis ^(S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



QTS Environmental Ltd
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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 17-59273	Date Sampled	19/05/17	19/05/17	19/05/17	19/05/17	
Dunton Environmental Ltd	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Site Reference: Head Office	TP / BH No	Cement Kiln Dust Sample 1	Cement Kiln Dust Sample 2	Cement Kiln Dust Sample 3	Cement Kiln Dust Sample 4	
Project / Job Ref: None Supplied	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	
Order No: None Supplied	Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Reporting Date: 25/05/2017	QTSE Sample No	270033	270034	270035	270036	

Determinand	Unit	RL	Accreditation	(n)	(n)	(n)	(n)
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	< 1.6	< 1.6	< 1.6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation



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Maidstone
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Soil Analysis Certificate - Sample Descriptions

QTS Environmental Report No: 17-59273	
Dunton Environmental Ltd	
Site Reference: Head Office	
Project / Job Ref: None Supplied	
Order No: None Supplied	
Reporting Date: 25/05/2017	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
270033	Cement Kiln Dust Sample 1	None Supplied	None Supplied	< 0.1	Light grey concrete
270034	Cement Kiln Dust Sample 2	None Supplied	None Supplied	< 0.1	Light grey concrete
270035	Cement Kiln Dust Sample 3	None Supplied	None Supplied	< 0.1	Light grey concrete
270036	Cement Kiln Dust Sample 4	None Supplied	None Supplied	0.2	Light grey concrete

Moisture content is part of procedure E003 & is not an accredited test

Insufficient Sample ^{1/S}

Unsuitable Sample ^{U/S}



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Lenham Heath
Maidstone
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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 17-59273
Dunton Environmental Ltd
Site Reference: Head Office
Project / Job Ref: None Supplied
Order No: None Supplied
Reporting Date: 25/05/2017

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 - C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Waste Classification Report



MLCCN-F2DUM-NKEFU

Job name

Cement Kiln Dust Research

Description/Comments

Project

Cement Kiln Dust Research

Site

Kilnwood Vale

Waste Stream Template

Cement Kiln Dust Research

Classified by

Name:
Adrian Jefimiuk
Date:
26/05/2017 13:12:29 UTC
Telephone:
07880190101

Company:
Dunton Environmental
Unit 1, Tamebridge Industrial Estate
Perry Barr, Aldridge Road
Birmingham
B42 2TX

Report

Created by: Adrian Jefimiuk
Created date: 26/05/2017 13:12 UTC

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	Cement Kiln Dust Sample 1		Potentially Hazardous	HP 4, HP 8	2
2	Cement Kiln Dust Sample 2		Potentially Hazardous	HP 4, HP 8	4
3	Cement Kiln Dust Sample 3		Potentially Hazardous	HP 4, HP 8	6
4	Cement Kiln Dust Sample 4		Potentially Hazardous	HP 4, HP 8	8

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	10
Appendix B: Rationale for selection of metal species	10
Appendix C: Version	11

Classification of sample: Cement Kiln Dust Sample 1

*** Potentially Hazardous Waste**
Classified as **10 13 13** or **10 13 12 ***
in the List of Waste

Sample details

Sample Name: Cement Kiln Dust Sample 1	LoW Code: Chapter: Entry:	10: Wastes from Thermal Processes 10 13 13 or 10 13 12 * (solid wastes from gas treatment other than those mentioned in 10 13 12 or solid wastes from gas treatment containing hazardous substances)
--	---------------------------------	---

Hazard properties (substances considered hazardous until shown otherwise)

HP 4: Irritant - skin irritation and eye damage "waste which on application can cause skin irritation or damage to the eye"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 12.9 pH)

HP 8: Corrosive "waste which on application can cause skin corrosion"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"






Because of determinand:

pH: (conc.: 12.9 pH)

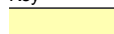




Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				12.9 pH		12.9	pH	12.9 pH		
2	pH: acid/alkali reserve				10.8 gNaOH		10.8	gNaOH	10.8 gNaOH		
3	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	30 mg/kg	1.32	39.61	mg/kg	0.00396 %		
4	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	<1 mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	24.7 mg/kg	1.285	31.746	mg/kg	0.00247 %		
6	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9	39 mg/kg	1.462	57.001	mg/kg	0.0057 %		
7	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<2 mg/kg	1.923	<3.846	mg/kg	<0.000385 %		<LOD
8	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8	59 mg/kg	3.929	231.814	mg/kg	0.0232 %		

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
9	lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	916 mg/kg		916 mg/kg	0.0916 %			
	082-001-00-6										
10	mercury {  mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD	
	080-010-00-X	231-299-8	7487-94-7								
11	nickel {  nickel sulfate }				25 mg/kg	2.637	65.917 mg/kg	0.00659 %			
	028-009-00-5	232-104-9	7786-81-4								
12	selenium {  selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<3 mg/kg	2.554	<7.661 mg/kg	<0.000766 %		<LOD	
	034-002-00-8										
13	zinc {  zinc sulphate }				838 mg/kg	2.469	2069.27 mg/kg	0.207 %			
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
								Total:	0.342 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Cement Kiln Dust Sample 2

*** Potentially Hazardous Waste**
Classified as **10 13 13** or **10 13 12 ***
in the List of Waste

Sample details

Sample Name: Cement Kiln Dust Sample 2	LoW Code: Chapter: Entry:	10: Wastes from Thermal Processes 10 13 13 or 10 13 12 * (solid wastes from gas treatment other than those mentioned in 10 13 12 or solid wastes from gas treatment containing hazardous substances)
--	---------------------------------	---

Hazard properties (substances considered hazardous until shown otherwise)

HP 4: Irritant - skin irritation and eye damage "waste which on application can cause skin irritation or damage to the eye"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 13.1 pH)

HP 8: Corrosive "waste which on application can cause skin corrosion"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"






Because of determinand:

pH: (conc.: 13.1 pH)

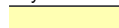




Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	pH		PH		13.1 pH		13.1 pH	13.1 pH		
2	pH: acid/alkali reserve				8.2 gNaOH		8.2 gNaOH	8.2 gNaOH		
3	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	28 mg/kg	1.32	36.969 mg/kg	0.0037 %		
4	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	<1 mg/kg	3.22	<3.22 mg/kg	<0.000322 %		<LOD
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	24.3 mg/kg	1.285	31.232 mg/kg	0.00243 %		
6	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9	37 mg/kg	1.462	54.078 mg/kg	0.00541 %		
7	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<2 mg/kg	1.923	<3.846 mg/kg	<0.000385 %		<LOD
8	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8	58 mg/kg	3.929	227.885 mg/kg	0.0228 %		

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
9	lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	892 mg/kg		892 mg/kg	0.0892 %		
	082-001-00-6									
10	mercury {  mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
11	nickel {  nickel sulfate }				23 mg/kg	2.637	60.644 mg/kg	0.00606 %		
	028-009-00-5	232-104-9	7786-81-4							
12	selenium {  selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<3 mg/kg	2.554	<7.661 mg/kg	<0.000766 %		<LOD
	034-002-00-8									
13	zinc {  zinc sulphate }				803 mg/kg	2.469	1982.845 mg/kg	0.198 %		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
Total:								0.329 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Cement Kiln Dust Sample 3

*** Potentially Hazardous Waste**
Classified as **10 13 13** or **10 13 12 ***
in the List of Waste

Sample details

Sample Name: Cement Kiln Dust Sample 3	LoW Code: Chapter: Entry:	10: Wastes from Thermal Processes 10 13 13 or 10 13 12 * (solid wastes from gas treatment other than those mentioned in 10 13 12 or solid wastes from gas treatment containing hazardous substances)
--	---------------------------------	---

Hazard properties (substances considered hazardous until shown otherwise)

HP 4: Irritant - skin irritation and eye damage "waste which on application can cause skin irritation or damage to the eye"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 13 pH)

HP 8: Corrosive "waste which on application can cause skin corrosion"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"






Because of determinand:

pH: (conc.: 13 pH)

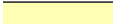




Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	• pH				13	pH		13	pH	13pH		
2	• pH: acid/alkali reserve				8.8	gNaOH		8.8	gNaOH	8.8 gNaOH		
3	• arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	31	mg/kg	1.32	40.93	mg/kg	0.00409 %		
4	• boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
5	• cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	25.2	mg/kg	1.285	32.388	mg/kg	0.00252 %	
6	• chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		40	mg/kg	1.462	58.462	mg/kg	0.00585 %	
7	• chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %	<LOD
8	• copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		62	mg/kg	3.929	243.601	mg/kg	0.0244 %	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
9	lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	924 mg/kg		924 mg/kg	0.0924 %		
	082-001-00-6									
10	mercury {  mercury dichloride }				<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
11	nickel {  nickel sulfate }				25 mg/kg	2.637	65.917 mg/kg	0.00659 %		
	028-009-00-5	232-104-9	7786-81-4							
12	selenium {  selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<3 mg/kg	2.554	<7.661 mg/kg	<0.000766 %		<LOD
	034-002-00-8									
13	zinc {  zinc sulphate }				848 mg/kg	2.469	2093.963 mg/kg	0.209 %		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							
Total:								0.347 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: Cement Kiln Dust Sample 4

*** Potentially Hazardous Waste**
Classified as **10 13 13** or **10 13 12 ***
in the List of Waste

Sample details

Sample Name: Cement Kiln Dust Sample 4	LoW Code: Chapter: Entry:	10: Wastes from Thermal Processes 10 13 13 or 10 13 12 * (solid wastes from gas treatment other than those mentioned in 10 13 12 or solid wastes from gas treatment containing hazardous substances)
--	---------------------------------	---

Hazard properties (substances considered hazardous until shown otherwise)

HP 4: Irritant - skin irritation and eye damage "waste which on application can cause skin irritation or damage to the eye"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"

Because of determinand:

pH: (conc.: 13.1 pH)

HP 8: Corrosive "waste which on application can cause skin corrosion"

Risk phrases hit:

pH; pH "Assumed to be irritant/corrosive because of pH value"






Because of determinand:

pH: (conc.: 13.1 pH)

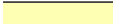




Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	pH				13.1	pH		13.1	pH	13.1 pH		
2	pH: acid/alkali reserve				9.2	gNaOH		9.2	gNaOH	9.2 gNaOH		
3	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3	31	mg/kg	1.32	40.93	mg/kg	0.00409 %		
4	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2	<1	mg/kg	3.22	<3.22	mg/kg	<0.000322 %		<LOD
5	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	24.7	mg/kg	1.285	31.746	mg/kg	0.00247 %	
6	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		38	mg/kg	1.462	55.539	mg/kg	0.00555 %	
7	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<2	mg/kg	1.923	<3.846	mg/kg	<0.000385 %	<LOD
8	copper { copper sulphate pentahydrate }	029-023-00-4	231-847-6	7758-99-8		57	mg/kg	3.929	223.956	mg/kg	0.0224 %	

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
9	lead {  lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	901 mg/kg		901	mg/kg	0.0901 %		
	082-001-00-6										
10	mercury {  mercury dichloride }				<1 mg/kg	1.353	<1.353	mg/kg	<0.000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
11	nickel {  nickel sulfate }				24 mg/kg	2.637	63.28	mg/kg	0.00633 %		
	028-009-00-5	232-104-9	7786-81-4								
12	selenium {  selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<3 mg/kg	2.554	<7.661	mg/kg	<0.000766 %		<LOD
	034-002-00-8										
13	zinc {  zinc sulphate }				830 mg/kg	2.469	2049.516	mg/kg	0.205 %		
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]								
							Total:		0.338 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Potentially Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: None.
Hazard Statements: None.

- **pH: acid/alkali reserve**

Description/Comments: Appendix C4; unit: grams of sodium hydroxide (equivalent) per 100g of substance required to adjust the pH to the appropriate value
Data source: WM3 1st Edition 2015
Data source date: 25/05/2015
Risk Phrases: None.
Hazard Statements: None.

- **chromium(III) oxide** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>
Data source date: 17/07/2015
Risk Phrases: R20 , R22 , R36 , R37 , R38 , R42 , R43 , R50/53 , R60 , R61
Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

- **copper sulphate pentahydrate** (EC Number: 231-847-6, CAS Number: 7758-99-8)

CLP index number: 029-023-00-4
Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)
Additional Risk Phrases: N R50/53 , N R50/53 >= 2.5 %
Additional Hazard Statement(s): None.
Reason for additional Hazards Statement(s)/Risk Phrase(s):
10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10/10/2016 - N R50/53 >= 2.5 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

- **lead compounds with the exception of those specified elsewhere in this Annex (worst case)**

CLP index number: 082-001-00-6
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03/06/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

(enter justification for selecting this species)

boron {diboron trioxide; boric oxide}

(enter justification for selecting this species)

cadmium {cadmium sulfide}

(enter justification for selecting this species)

chromium in chromium(III) compounds {chromium(III) oxide}

(enter justification for selecting this species)

chromium in chromium(VI) compounds {chromium(VI) oxide}

(enter justification for selecting this species)

copper {copper sulphate pentahydrate}

(enter justification for selecting this species)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

No Chromium VI in the sample

mercury {mercury dichloride}

(enter justification for selecting this species)

nickel {nickel sulfate}

No Chromium VI in the sample

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

(enter justification for selecting this species)

zinc {zinc sulphate}

No Chromium VI in the sample.

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition, May 2015**

HazWasteOnline Classification Engine Version: 2017.129.3312.6648 (09 May 2017)

HazWasteOnline Database: 2017.129.3312.6648 (09 May 2017)

This classification utilises the following guidance and legislation:

WM3 - Waste Classification - May 2015

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004

1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010

2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010



Report

Cement Kiln Dust: *In vitro* EPIDERM™ Skin Corrosion Test

Envigo Study Number:	LL26CM
Sponsor Name:	Dunton Environmental
Version ID:	Draft
Issue Date:	Click here to enter a date.
Study Director:	N Warren
Testing Facility:	Envigo Research Limited Shardlow Business Park Shardlow Derbyshire DE72 2GD UK

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LIST OF APPENDIX

Appendix 1 Mean OD₅₇₀ Values and Viabilities for the Negative Control Item,
Positive Control Item and Test Item17

LIST OF ANNEX

Annex 1 GLP Certificate19

COMPLIANCE WITH GOOD LABORATORY PRACTICE

Cement Kiln Dust: *In vitro* EPIDERM™ Skin Corrosion Test

With the exceptions stated below the study described in this report was conducted in compliance with the following Good Laboratory Practice standards and I consider the data generated to be valid.

- The UK Good Laboratory Practice Regulations (Statutory Instrument 1999 No. 3106, as amended by Statutory Instrument 2004 No. 994)
- OECD Principles of Good Laboratory Practice (as revised in 1997), ENV/MC/CHEM(98)17
- EC Commission Directive 2004/10/EC of 11 February 2004

These principles of Good Laboratory Practice are accepted by the members of the OECD Mutual Acceptance of Data including the European Community/United States of America and Japan.

No information has been provided for the purity of the test item and as such no claim of compliance can be made for this information.

No information has been provided for the expiry date of the test item and as such no claim of compliance can be made for this information.

These exceptions are considered not to affect the integrity or validity of the study.

N Warren
Study Director
Envigo Research Limited

Date

QUALITY ASSURANCE STATEMENT

Cement Kiln Dust: *In vitro* EPIDERM™ Skin Corrosion Test

Study based activities at the Test Facility, Envigo – Shardlow, were audited and inspected. The details of these audits and inspections are given below.

Type of Inspection	Date(s) of Inspection	Date Reporting to Study Director, Test Facility Management
Study Plan Verification	05 July 2017	05 July 2017
Process – based Test Item Preparation	06 September 2017	06 September 2017
Process – based Test System Preparation and Application	07 September 2017	07 September 2017
Process– based Assessment of Response	29 September 2017	29 September 2017
Report Audit	26 October 2017	26 October 2017

General facilities and activities where this study was conducted were inspected on an annual basis and results are reported to the relevant responsible person and Management.

Quality Assurance

A Measures
Quality Consultant
Envigo Research Limited

Date

1 SUMMARY

Introduction

The purpose of this test is to evaluate the corrosivity potential of the test item using the EpiDerm™ Human Skin Model after treatment periods of 3 and 60 minutes.

Corrosion is directly related to cytotoxicity in the EpiDerm™ tissue. Cytotoxicity is determined by the reduction of MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl-tetrazolium bromide) to formazan by viable cells in the test item treated tissues relative to the corresponding negative control. The results are used to make a prediction of the corrosivity potential of the test item.

Methods

Duplicate tissues were treated with the test item for exposure periods of 3 and 60 minutes. Negative and positive control groups were treated for each exposure period. At the end of the exposure period the test item was rinsed from each tissue before each tissue was taken for MTT-loading. After MTT loading each tissue was placed in 2 mL Isopropanol for MTT extraction.

At the end of the formazan extraction period each well was mixed thoroughly and triplicate 200 µL samples were transferred to the appropriate wells of a pre-labeled 96-well plate. The optical density (OD) was measured at 570 nm (OD₅₇₀).

Data are presented in the form of percentage viability (MTT reduction in the test item treated tissues relative to negative control tissues).

Results

The relative mean viabilities for each treatment group were as follows:

Exposure Period	Percentage Viability		
	Negative Control	Positive Control	Test Item
3 minute	100*	4.1	101.1
60 minute	100*	3.5	54.2

*The mean viability of the negative control tissues is set at 100%

Quality criteria: The quality criteria required for acceptance of results in the test were satisfied.

Conclusion

The test item was considered to be non-corrosive to the skin.

2 INTRODUCTION AND PURPOSE

The purpose of this test is to evaluate the corrosivity potential of the test item using the EpiDerm™ Human Skin Model after treatment periods of 3 and 60 minutes.

Corrosion is directly related to cytotoxicity in the EpiDerm™ tissue. Cytotoxicity is determined by the reduction of MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl-tetrazolium bromide) to formazan by viable cells in the test item treated tissues relative to the corresponding negative control. The results are used to make a prediction of the corrosivity potential of the test item.

This model incorporates several features, which make it advantageous in the study of potential dermal corrosivity. The target cells are epithelial, derived from human skin, and formed into a stratified, cornified epithelium. Test items are applied to the culture surface, at the air interface, so that undiluted and/or end use dilutions can be tested directly.

2.1 Study Details

Sponsor	Dunton Environmental Unit 1, Tamebridge Industrial Estate Perry Barr Aldridge Road Birmingham B42 2TX UNITED KINGDOM
----------------	--

2.2 Study Schedule

Experimental start date 07 September 2017

Experimental completion date 08 September 2017

2.3 Regulatory Testing Guidelines

The study was performed in compliance with the following regulations or guidelines:

- OECD Guideline for the Testing of Chemicals No. 431 *In Vitro* Skin Corrosion: Reconstructed Human EpiDermis (RHE) Test Method (29 July 2016)
- Method B.40bis of Commission Regulation (EC) No 440/2008, of 30 May 2008, laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

3 MATERIALS AND TEST METHODS

3.1 Test Item and Supporting Information

Information as provided by the Sponsor.

Identification:	Cement Kiln Dust
Batch:	Not supplied
Purity:	Not supplied
Physical state/Appearance:	Light grey powder
Expiry Date:	Not supplied
Storage Conditions:	Room temperature in the dark

3.1.1 Test Item Preparation

The test item was used as supplied.

3.2 Reference Items

3.2.1 Negative Control

Information as provided by the Supplier.

Identification:	Sterile distilled water
Batch:	3012436
Purity:	Not supplied
Expiry Date:	01 October 2018
Storage Conditions:	Room temperature
Supplier:	Aguettant Ltd

3.2.2 Positive Control

Information as provided by the Supplier.

Identification:	8.0N Potassium Hydroxide
Batch:	SLBM9898V
Purity:	7.92M
Expiry Date:	07 April 2020
Storage Conditions:	Room temperature
Supplier:	Sigma-Aldrich

3.2.3 Preparation of Negative and Positive Control Items and MTT

The negative control item was used as supplied.

The positive control item was used as supplied.

A 1.0 mg/mL MTT solution was prepared from a MatTek MTT-100 kit immediately prior to usage.

3.3 Test System

3.3.1 EpiDerm™ Reconstructed Human Epidermis Model Kit

Supplier	:	MatTek
Date received	:	05 September 2017
EpiDerm™ Tissues (0.63cm ²) lot number	:	25840
Assay Medium lot number	:	083117ALA

Upon receipt of the EpiDerm™ tissues, the sealed 24-well plate was stored in a refrigerator until use.

3.4 Study Design

3.4.1 Pre-Test Procedure

3.4.1.1 Assessment of Direct Test Item Reduction of MTT

MTT Dye Metabolism, Cell Viability Assay

The MTT assay, a colorimetric method of determining cell viability, is based on reduction of the yellow tetrazolium salt (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl-tetrazolium bromide) to a blue formazan dye by mitochondrial succinate dehydrogenase in viable cells.

One limitation of the assay is possible interference of the test item with MTT. A test item may directly reduce MTT, thus mimicking dehydrogenase activity of the cellular mitochondria. This property of the test item is only a problem if at the time of the MTT test (after rinsing) there is still a sufficient amount of the test item present on or in the tissues. In this case, the true metabolic MTT reduction and the false direct MTT reduction can be differentiated and quantified.

Test for Direct MTT Reduction

As specified, a test item may interfere with the MTT endpoint, if it was able to directly reduce MTT and at the same time was present on or in the tissues when the MTT viability test was performed. To identify this possible interference, the test item was checked for the ability to directly reduce MTT according to the procedure below:

25 mg of the test item was added to 1 mL of a freshly prepared 1.0 mg/mL MTT solution. The solution was incubated in the dark at 37 °C, 5% CO₂ in air for 60 minutes. Untreated MTT solution was tested concurrently to act as a control.

If the MTT solution containing the test item turns blue/purple relative to the control, the test item was presumed to have reduced the MTT.

3.4.1.2 Assessment of Color Interference with the MTT Endpoint

A test item may interfere with the MTT endpoint if it is colored or if it becomes colored when in wet or aqueous conditions. The MTT assay is affected only if the test item is present in the tissues when the MTT viability assay is performed.

25 mg of test item was added to 300 µL of sterile water. The solution was incubated in the dark at 37 °C, 5% CO₂ in air for 60 minutes. A visual assessment of the color was then made.

3.4.2 Main Test

3.4.2.1 Pre-Incubation

The assay medium was pre-warmed before use. 0.9 mL of this assay medium was pipetted into the appropriate wells of two pre-labeled 6-well plates for both the 3-Minute and 60-Minute exposure periods. EpiDerm™ tissues were transferred into the 6-well plates containing the assay medium. The 6-well plates containing the EpiDerm™ samples were pre-incubated (37 °C, 5% CO₂) for approximately 1 hour before dosing.

3.4.2.2 Application of Test Item and Rinsing

Before pre-incubation was complete, a 24-well plate was prepared for use as a “holding plate” for both the 3-Minute and 60-Minute exposure periods. This plate was used to maintain the viability of the tissue inserts between rinsing following chemical exposure and MTT loading. Another 24-well plate was prepared for the MTT loading. 300 µL of either

pre-warmed assay medium (holding plate) or MTT medium (MTT loading plate) was dispensed into each well. The two plates were placed into the incubator until required.

After pre-incubation of the EpiDerm™ tissues, the medium was aspirated and replaced with 0.9 mL of fresh assay medium. The 6-well plate for the 3-Minute exposure period was returned to the incubator, while the other was being dosed for the 60-Minute exposure. For the 60-Minute exposure period, 50 µL of sterile distilled water (negative control) was added to the first two tissues. The tissues were dosed at regular intervals to allow for the time taken to rinse each tissue following exposure and to ensure that each tissue gets an equal exposure time. 25 mg of the test item and 50 µL of 8.0 N Potassium Hydroxide (positive control) were also applied to the corresponding tissues in turn. 25 µL of sterile water was added for wetting of the test item to increase tissue surface contact. The plate was returned to the incubator (37 °C, 5% CO₂) for the 60-Minute exposure period.

When dosing for the 60-Minute exposure period was complete, the same procedure was repeated for the 3-Minute exposure period. Because the exposure time was so short, the tissues were dosed at regular intervals to ensure that each tissue received an equal exposure time and to allow for the time taken to rinse each tissue following exposure. Rinsing was achieved by filling and emptying each tissue under a constant soft stream of Dulbecco's Phosphate Buffered Saline (DPBS) to gently remove any residual test item. Excess DPBS was removed by blotting the bottom of the tissue insert with tissue paper. Each tissue was placed into the prepared holding plate until all tissues were rinsed. They were then blotted and transferred to the 24-well plate prepared for MTT loading. The plate was incubated (37 °C, 5% CO₂) for 3 hours. Once the 60-Minute exposure period was complete, the same rinsing and MTT loading procedure was repeated.

After the 3-Hour MTT incubation was complete, the inserts were blotted and transferred to labeled 24-well plates for MTT extraction. 2 mL of MTT extractant (isopropanol) was used to completely immerse each insert and the plate was covered with plate sealer to prevent Isopropanol evaporation. The plates stood overnight at room temperature, to allow extraction to proceed.

3.4.2.3 Absorbance/Optical Density Measurements

After extraction, each tissue was pierced with a pipette fitted with a 1000 µL tip and the extraction solution was forced vigorously up and down to form a homogenous solution. 3 x 200 µL aliquots of the extract were transferred to the appropriate wells of a pre-labeled 96-well plate. 200 µL of isopropanol alone was added to the three wells designated as blanks. Absorbency at 570nm (OD₅₇₀) of each well was measured using the Labtech LT-4500 microplate reader.

3.5 Data Evaluation

3.5.1 Quantitative MTT Assessment (percentage tissue viability)

The corrosivity potential of the test item was predicted from the relative mean tissue viabilities obtained after the 3 and 60-Minute exposure periods, compared to the mean of the

negative control tissues (n=2) treated with sterile distilled water. The relative mean viabilities were calculated in the following way:

$$\text{Relative mean viability (\%)} = \frac{\text{mean OD}_{570} \text{ of test item}}{\text{mean OD}_{570} \text{ of negative control}} \times 100$$

Classification of corrosivity potential is based on relative viabilities for both exposure times according to the following table:

Viability Measured after Exposure Time Points	Prediction to be considered according to EU CLP Regulation (EC) No 1272/2008 UN GHS
STEP 1	
< 50% after 3 min exposure	Corrosive
≥ 50% after 3 min exposure AND < 15% after 60 min exposure	Corrosive
≥ 50% after 3 min exposure AND ≥ 15% after 60 min exposure	Non-corrosive
STEP 2 for test items identified as corrosive in step 1	
< 25% after 3 min exposure	H314 Sub-category 1A
≥ 25% after 3 min exposure	H314 Combination of sub-categories 1B-and-1C

3.5.2 Quality Criteria

The results of the assay are considered acceptable if the following assay acceptance criteria are achieved:

Negative Control

The absolute OD₅₇₀ of the negative control treated tissues in the MTT-test is an indicator of tissue viability obtained in the testing laboratory after the shipping and storing procedure and under specific conditions of the assay. The mean OD₅₇₀ of the two negative control tissues should be ≥ 0.8 and ≤ 2.8 for each exposure time, which ensures that the tissue viability meets the acceptance criteria.

Positive Control

Potassium Hydroxide 8.0N solution is used as a positive control. An assay meets the acceptance criterion if mean relative tissue viability of the 60-Minute positive control is < 15%.

Coefficient of Variation

In the range 20 and 100% viability, the Coefficient of Variation between tissue replicates should be $\leq 30\%$.

3.6 Major Computerized Systems

The following computerized system was used in the study:

Delta Building Monitoring System

Labtech LT-4500 and LT-com software

4 DEVIATIONS FROM STUDY PLAN

There were no deviations from the Study Plan.

5 ARCHIVING

Records and documentation relating to this study (including electronic records) will be maintained in the archives of Envigo Research Limited for a period of 2 years from the date on which the Study Director signs the final report. This will include the raw data that support the reconstruction of the study.

At termination of the aforementioned period, the Sponsor will be contacted in order to determine the final disposition of these records and materials. After the specified period, the Sponsor is responsible for all costs associated with the retention, retrieval, onward transfer or destruction/disposal of these materials. If the Sponsor is unresponsive the records will be destroyed in accordance with the Envigo - Shardlow Standard Operating Procedure.

In case records are transferred, the Sponsor should ensure that the materials and records in support of regulatory studies are retained and maintained under conditions that guarantee their integrity and continued access according to archiving requirements of the principles of GLP. The Sponsor should also ensure that such materials and records are retained for as long as required by relevant authorities.

Envigo will retain the Study Plan, final report and any amendments indefinitely.

6 RESULTS

6.1 Direct MTT Reduction

The MTT solution containing the test item did not turn blue/purple. This was taken to indicate the test item did not reduce MTT.

6.2 Assessment of Color Interference with the MTT endpoint

The solution containing the test item did not become colored. This was taken to indicate the test item did not have the potential to cause color interference.

6.3 Test Item, Positive Control Item and Negative Control Item

Mean OD₅₇₀ values and viabilities for the negative control, positive control and test item are given in [Appendix 1](#).

The relative mean viabilities for each treatment group were as follows:

Exposure Period	Percentage Viability		
	Negative Control	Positive Control	Test Item
3 minute	100*	4.1	101.1
60 minute	100*	3.5	54.2

*The mean viability of the negative control tissues is set at 100%

6.4 Quality Criteria

The mean OD₅₇₀ for the negative control treated tissues was 1.567 for the 3-Minute exposure period and 1.707 for the 60-Minute exposure period. The negative control acceptance criteria were therefore satisfied.

The relative mean tissue viability for the positive control treated tissues was 3.5% relative to the negative control following the 60-Minute exposure period. The positive control acceptance criterion was therefore satisfied.

In the range 20 to 100% viability the Coefficient of Variation between the two tissue replicates of each treatment group did not exceed 30%. The acceptance criterion was therefore satisfied.

7 CONCLUSION

The test item was considered to be non-corrosive to the skin.

8 REFERENCES

Barratt, M.D., Brantom, P.G., Fentem, J.H., Gerner, I., Walker, A.P., and Worth, A.P. (1998). The ECVAM international validation study on *in vitro* tests for skin corrosivity. 1. Selection and distribution of the test chemicals. *Toxic. In Vitro* 12, 471-482.

Botham, P.A., Chamberlain, M., Barratt, M.D., Curren, R.D., Esdaile, D.J., Gardener, J.R., Gordon, V.C., Hildebrand, B., Lewis, R.W., Liebsch, M., Logemann, P., Osborne, R., Ponc, M., Regnier, J.F., Steiling, W., Walker, A.P., and Balls, M. (1995) A prevalidation study on *in vitro* skin corrosivity testing. The report and recommendations of ECVAM Workshop 6. *ATLA* 23, 219-255.

Fentem, J.H., Archer, G.E.B., Balls, M., Botham, P.A., Curren, R.D., Earl, L.K., Esdaile, D.J., Holzhutter, H.-G., and Liebsch, M. (1998). The ECVAM international validation study on *in vitro* tests for skin corrosivity. 2. Results and evaluation by the Management Team. *Tox. In Vitro* 12, 483-524.

APPENDIX

Appendix 1 Mean OD₅₇₀ Values and Viabilities for the Negative Control Item, Positive Control Item and Test Item

Tissue	Exposure Period	Mean OD ₅₇₀ of individual tissues	Mean OD ₅₇₀ of duplicate tissues	Standard Deviation	Coefficient of Variation (%)	Relative Mean Viability (%)
Negative Control	3 Minutes	1.415	1.567	0.214	13.7	100*
		1.718				
	60 Minutes	1.701	1.707	0.008	0.5	
		1.713				
Positive Control	3 Minutes	0.067	0.064	0.004	na	4.1
		0.061				
	60 Minutes	0.059	0.060	0.001	na	3.5
		0.061				
Test Item	3 Minutes	1.711	1.585	0.178	11.2	101.1
		1.459				
	60 Minutes	1.096	0.925	0.242	26.1	54.2
		0.754				

$$\text{Relative mean \% tissue viability} = \frac{\text{mean OD}_{570} \text{ of test item}}{\text{mean OD}_{570} \text{ of negative control}} \times 100$$

$$\text{Coefficient of variation} = \frac{\text{standard deviation}}{\text{mean OD}_{570} \text{ of duplicate tissues}} \times 100$$

OD = Optical density

* = The mean percentage viability of the negative control tissue is set at 100%

na = Not applicable

ANNEX

Annex 1 GLP Certificate

Department
of Health

**THE DEPARTMENT OF HEALTH OF THE GOVERNMENT
OF THE UNITED KINGDOM**

GOOD LABORATORY PRACTICE

**STATEMENT OF COMPLIANCE
IN ACCORDANCE WITH DIRECTIVE 2004/9/EC**

TEST FACILITY

ENVIGO RESEARCH LIMITED
SHARDLOW BUSINESS PARK
LONDON ROAD
SHARDLOW
DE72 2GD
UNITED KINGDOM

TEST TYPE(S)

Analytical/Clinical Chemistry
Environmental Fate
Environmental Toxicity
Physical/Chemical Testing
Mutagenicity
Toxicology

DATE OF INSPECTION: 05/07/2016

DATE OF ISSUE: 28/10/2016

An inspection for compliance with the Principles of Good Laboratory Practice was carried out at the above named test facility as part of the UK Good Laboratory Practice Compliance Monitoring Programme.

This statement confirms that, on the date of issue, the UK Good Laboratory Practice Monitoring Authority were satisfied that the above named test facility was operating in compliance with the OECD Principles of Good Laboratory Practice.

This statement constitutes a Good Laboratory Practice Instrument (as defined in the UK Good Laboratory Practice Regulations 1999).

Issued by
Dr Andrew J Gray
Head, UK GLP Monitoring Authority



Medicines & Healthcare products
Regulatory Agency



Appendix C

Historical maps

Envirocheck data for slices B to D are included electronically

Historical Mapping Legends

Ordnance Survey County Series 1:10,560

	Gravel Pit		Sand Pit		Other Pits
	Quarry		Shingle		Orchard
	Osiers		Reeds		Marsh
	Mixed Wood		Deciduous		Brushwood
	Fir		Furze		Rough Pasture
	Arrow denotes flow of water		Trigonometrical Station		
	Site of Antiquities		Bench Mark		
	Pump, Guide Post, Signal Post		Well, Spring, Boundary Post		
	-285 Surface Level				
	Sketched Contour		Instrumental Contour		
	Main Roads		Minor Roads		
	Sunken Road		Raised Road		
	Road over Railway		Railway over River		
	Railway over Road		Level Crossing		
	Road over River or Canal		Road over Stream		
	Road over Stream				
	County Boundary (Geographical)				
	County & Civil Parish Boundary				
	Administrative County & Civil Parish Boundary				
	County Borough Boundary (England)				
	County Burgh Boundary (Scotland)				
	Rural District Boundary				
	Civil Parish Boundary				

Ordnance Survey Plan 1:10,000

	Chalk Pit, Clay Pit or Quarry		Gravel Pit
	Sand Pit		Disused Pit or Quarry
	Refuse or Slag Heap		Lake, Loch or Pond
	Dunes		Boulders
	Coniferous Trees		Non-Coniferous Trees
	Orchard		Scrub
	Coppice		
	Bracken		Heath
	Rough Grassland		
	Marsh		Reeds
	Saltings		
	Building		Glasshouse
	Sloping Masonry		Pylon
	Electricity Transmission Line		Pole
	Cutting		Embankment
	Standard Gauge Multiple Track		
	Standard Gauge Single Track		
	Siding, Tramway or Mineral Line		
	Narrow Gauge		
	Geographical County		
	Administrative County, County Borough or County of City		
	Municipal Borough, Urban or Rural District, Burgh or District Council		
	Borough, Burgh or County Constituency Shown only when not coincident with other boundaries		
	Civil Parish Shown alternately when coincidence of boundaries occurs		
	BP, BS Boundary Post or Stone		Pol Sta Police Station
	Ch Church		PO Post Office
	CH Club House		PC Public Convenience
	F E Sta Fire Engine Station		PH Public House
	FB Foot Bridge		SB Signal Box
	Fn Fountain		Spr Spring
	GP Guide Post		TCB Telephone Call Box
	MP Mile Post		TCP Telephone Call Post
	MS Mile Stone		W Well

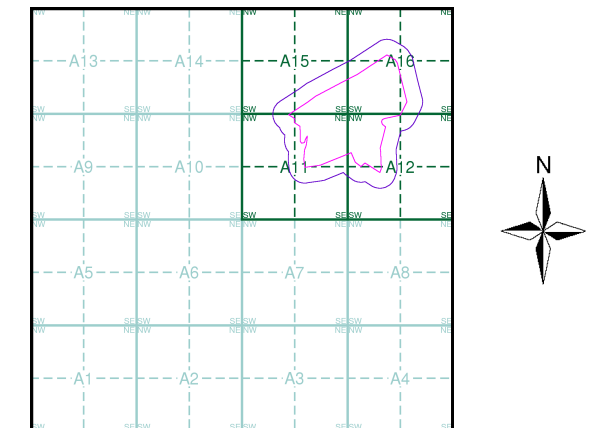
1:10,000 Raster Mapping

	Gravel Pit		Refuse tip or slag heap
	Rock		Rock (scattered)
	Boulders		Boulders (scattered)
	Shingle		Mud
	Sand		Sand Pit
	Slopes		Top of cliff
	General detail		Underground detail
	Overhead detail		Narrow gauge railway
	Multi-track railway		Single track railway
	County boundary (England only)		Civil, parish or community boundary
	District, Unitary, Metropolitan, London Borough boundary		Constituency boundary
	Area of wooded vegetation		Non-coniferous trees
	Non-coniferous trees (scattered)		Coniferous trees
	Coniferous trees (scattered)		Positioned tree
	Orchard		Coppice or Osiers
	Rough Grassland		Heath
	Scrub		Marsh, Salt Marsh or Reeds
	Water feature		Flow arrows
	MHW(S) Mean high water (springs)		MLW(S) Mean low water (springs)
	Telephone line (where shown)		Electricity transmission line (with poles)
	Bench mark (where shown)		Triangulation station
	Point feature (e.g. Guide Post or Mile Stone)		Pylon, flare stack or lighting tower
	Site of (antiquity)		Glasshouse
	General Building		Important Building

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:10,560	1879	2
Sussex	1:10,560	1899	3
Sussex	1:10,560	1912 - 1913	4
Sussex	1:10,560	1912 - 1913	5
Sussex	1:10,560	1932	6
Sussex	1:10,560	1938 - 1946	7
Historical Aerial Photography	1:10,560	1947	8
Ordnance Survey Plan	1:10,000	1961 - 1963	9
Ordnance Survey Plan	1:10,000	1968	10
Ordnance Survey Plan	1:10,000	1977 - 1979	11
Ordnance Survey Plan	1:10,000	1992	12
10K Raster Mapping	1:10,000	1999 - 2000	13
10K Raster Mapping	1:10,000	2006	14
VectorMap Local	1:10,000	2017	15

Historical Map - Slice A

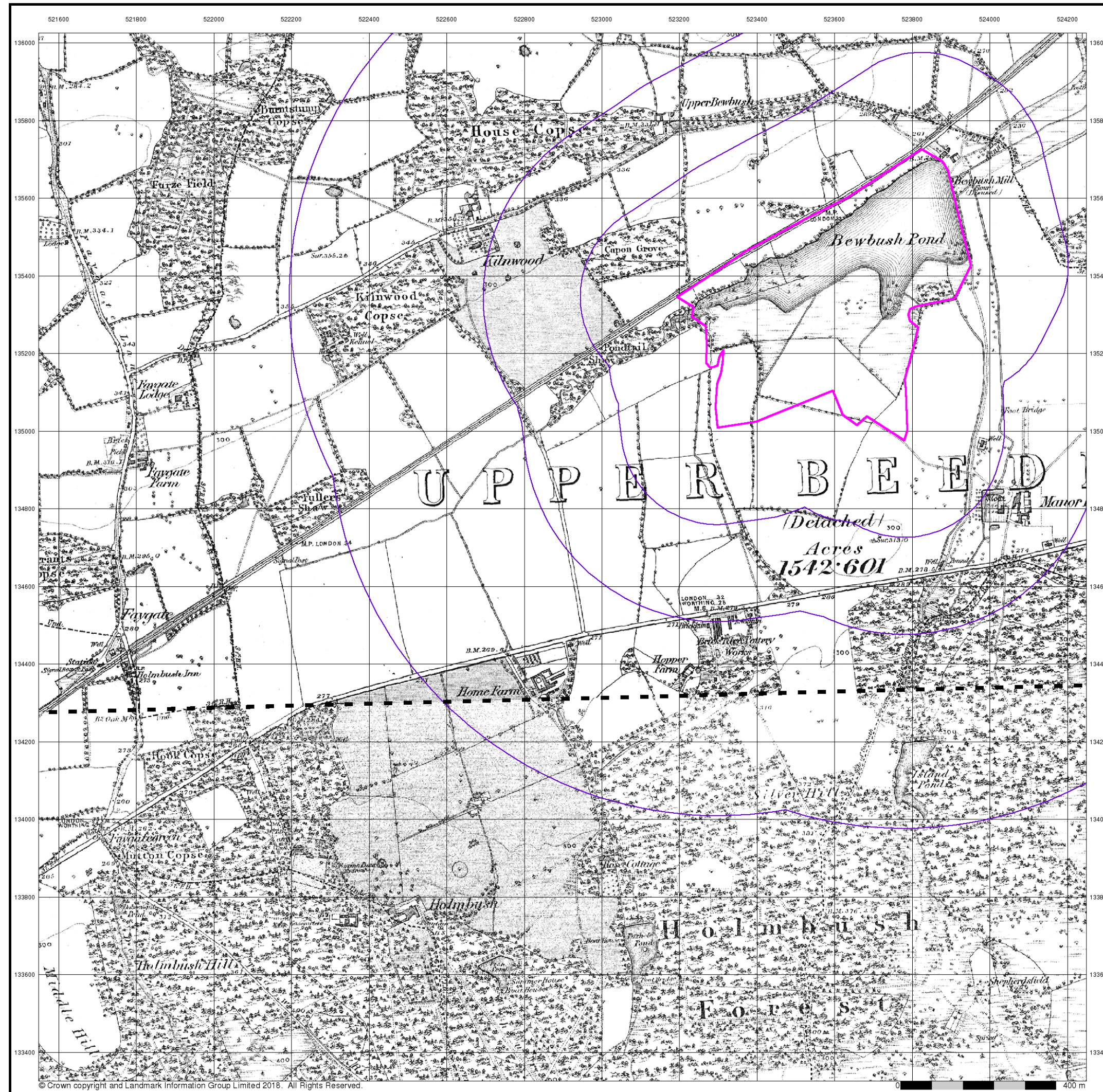


Order Details

Order Number: 155682781_1_1
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 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351



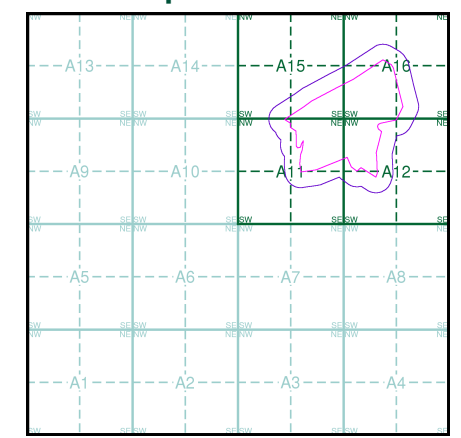
Sussex
Published 1879
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

00300	1879	1:10,560
01400	1879	1:10,560

Historical Map - Slice A

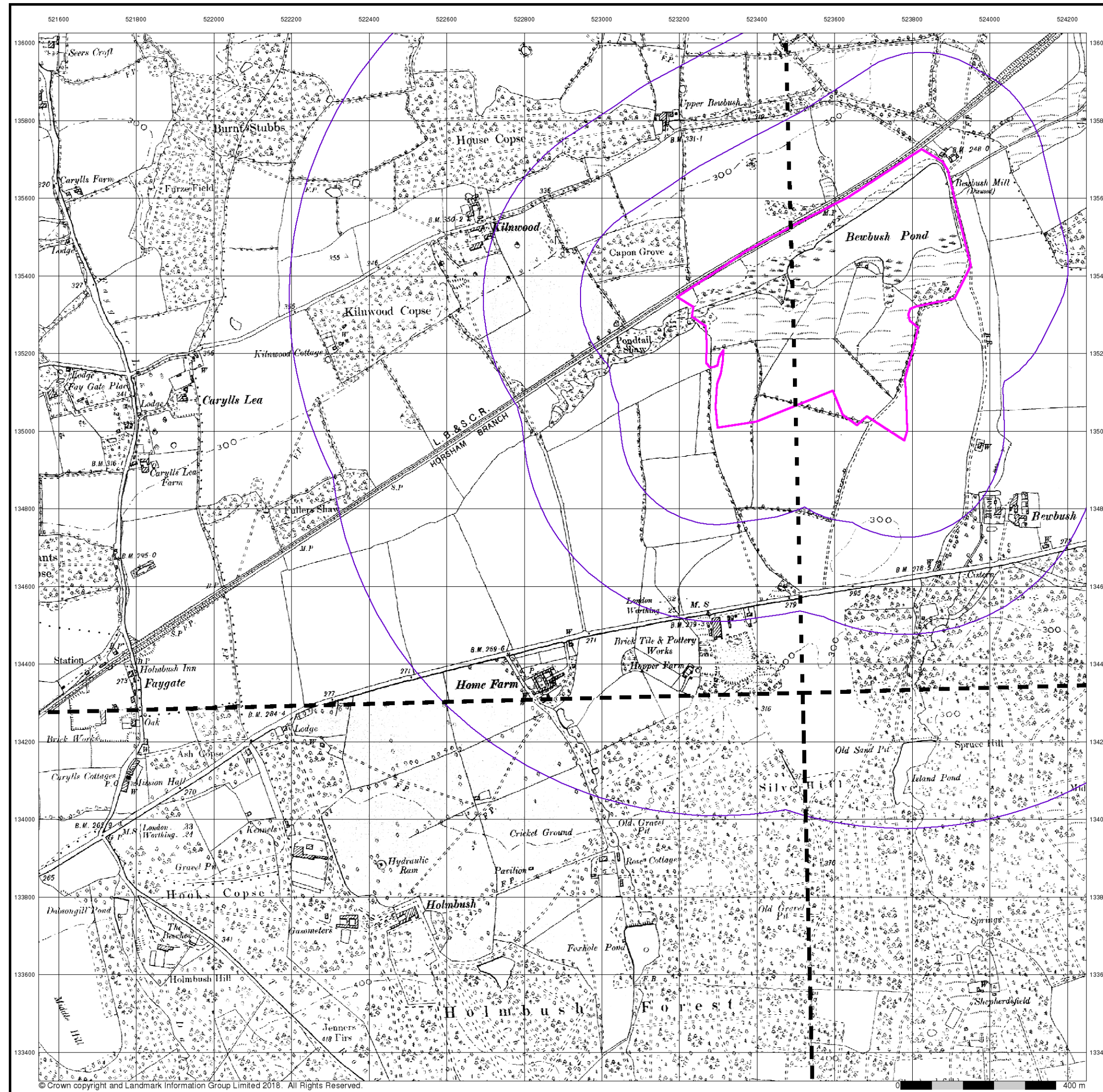


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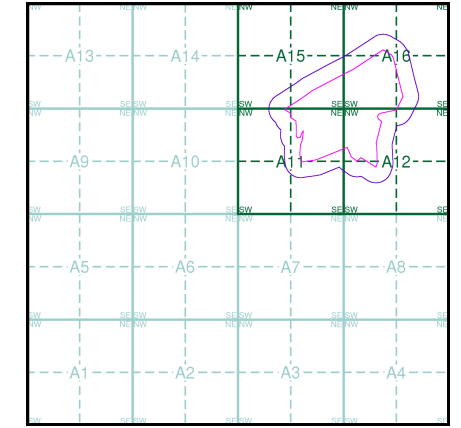
Sussex
Published 1899
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

003SW 1899 1:10,560	003SE 1899 1:10,560
014NW 1899 1:10,560	014NE 1899 1:10,560

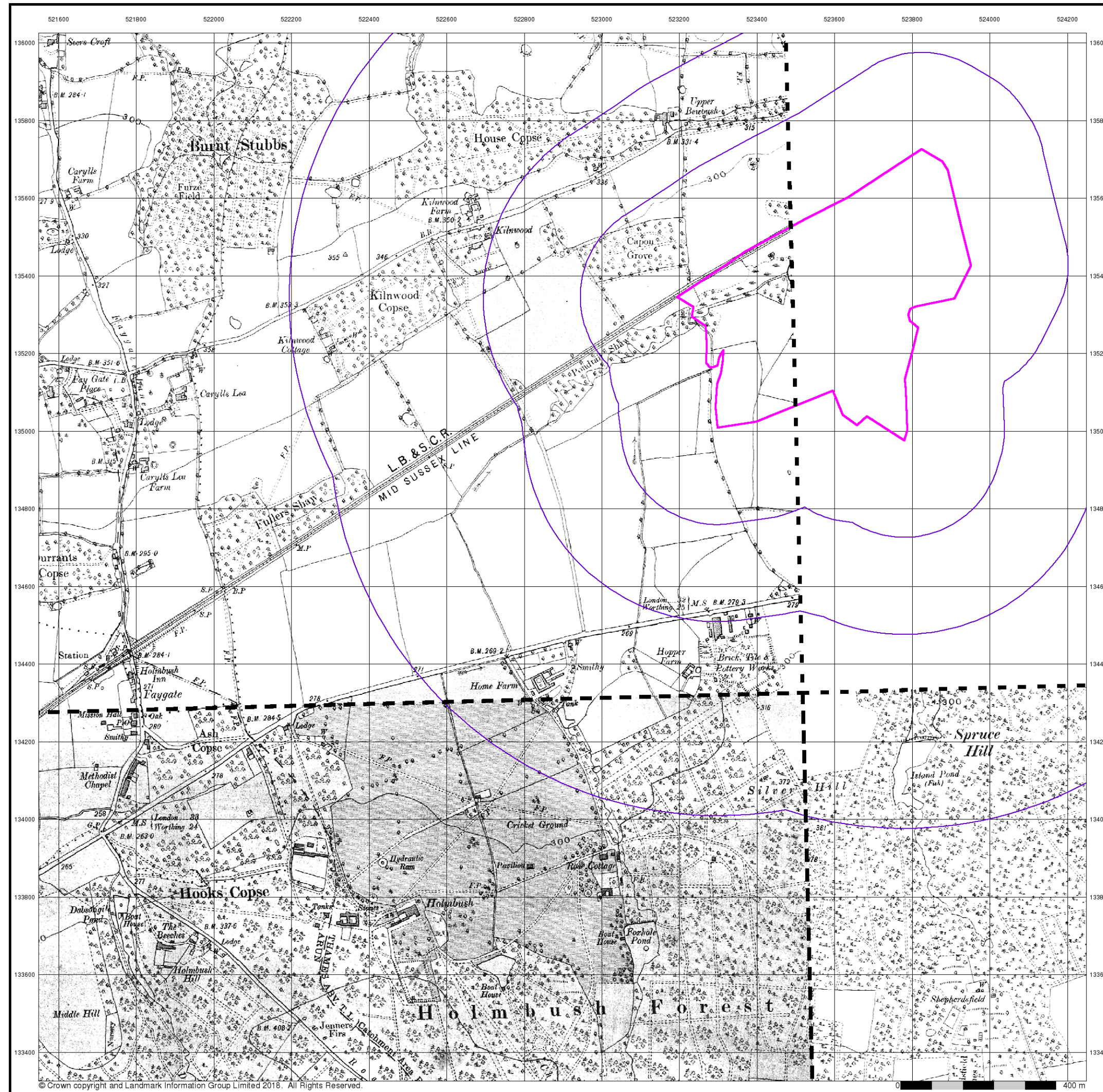
Historical Map - Slice A



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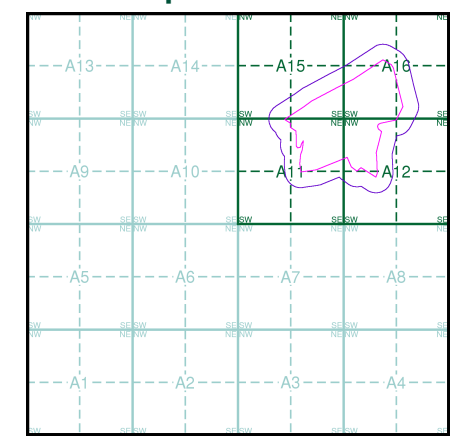
Sussex
Published 1912 - 1913
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

003SW 1913 1:10,560	014NE 1912 1:10,560
014NW 1913 1:10,560	

Historical Map - Slice A

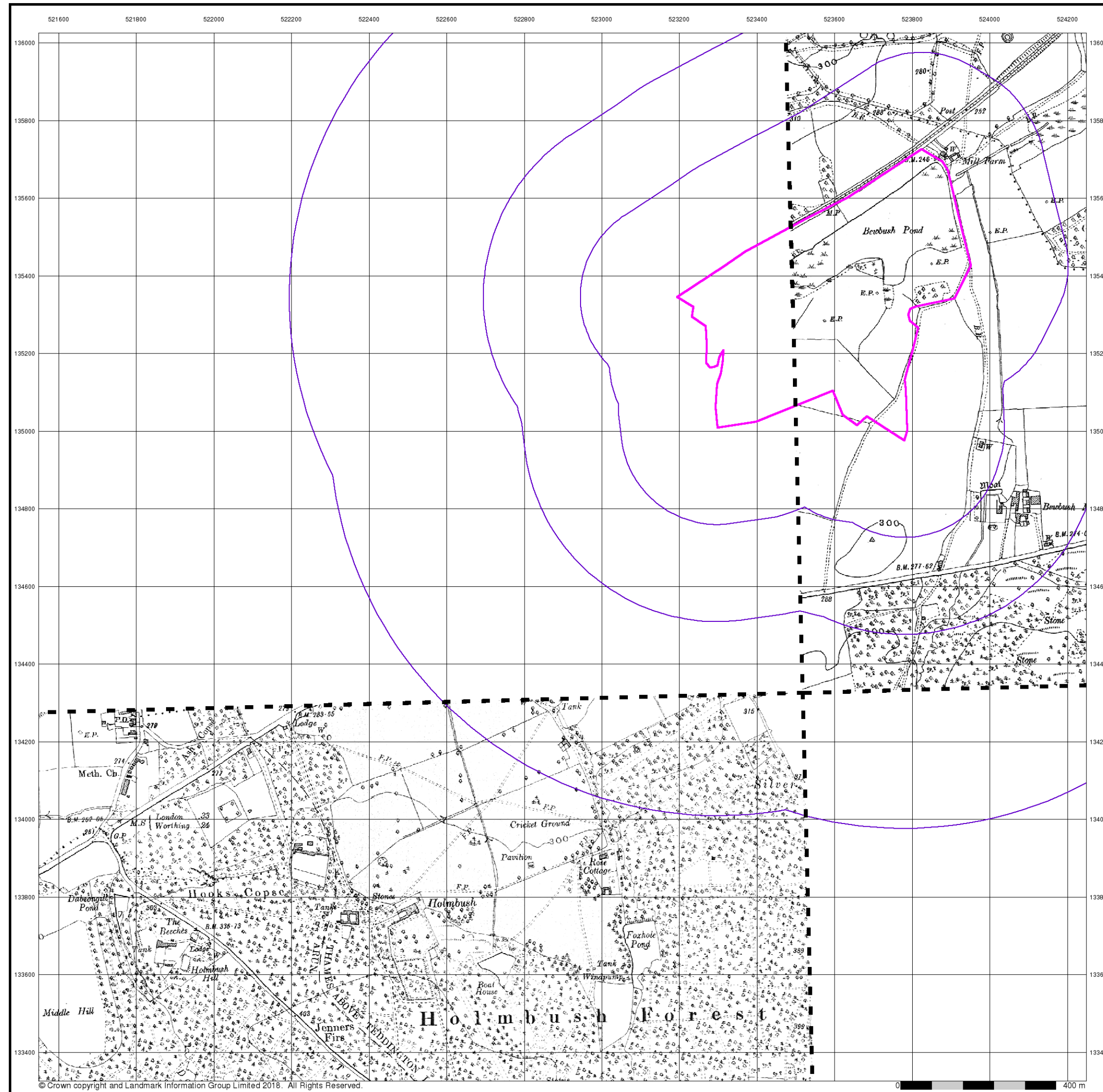


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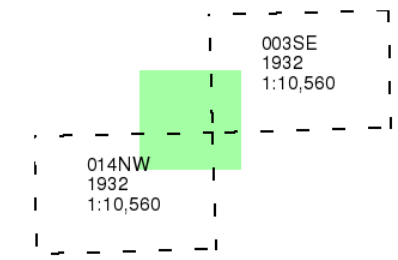
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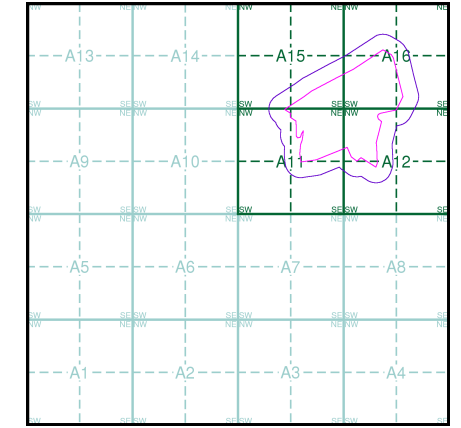
Sussex
Published 1932
Source map scale - 1:10,560

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

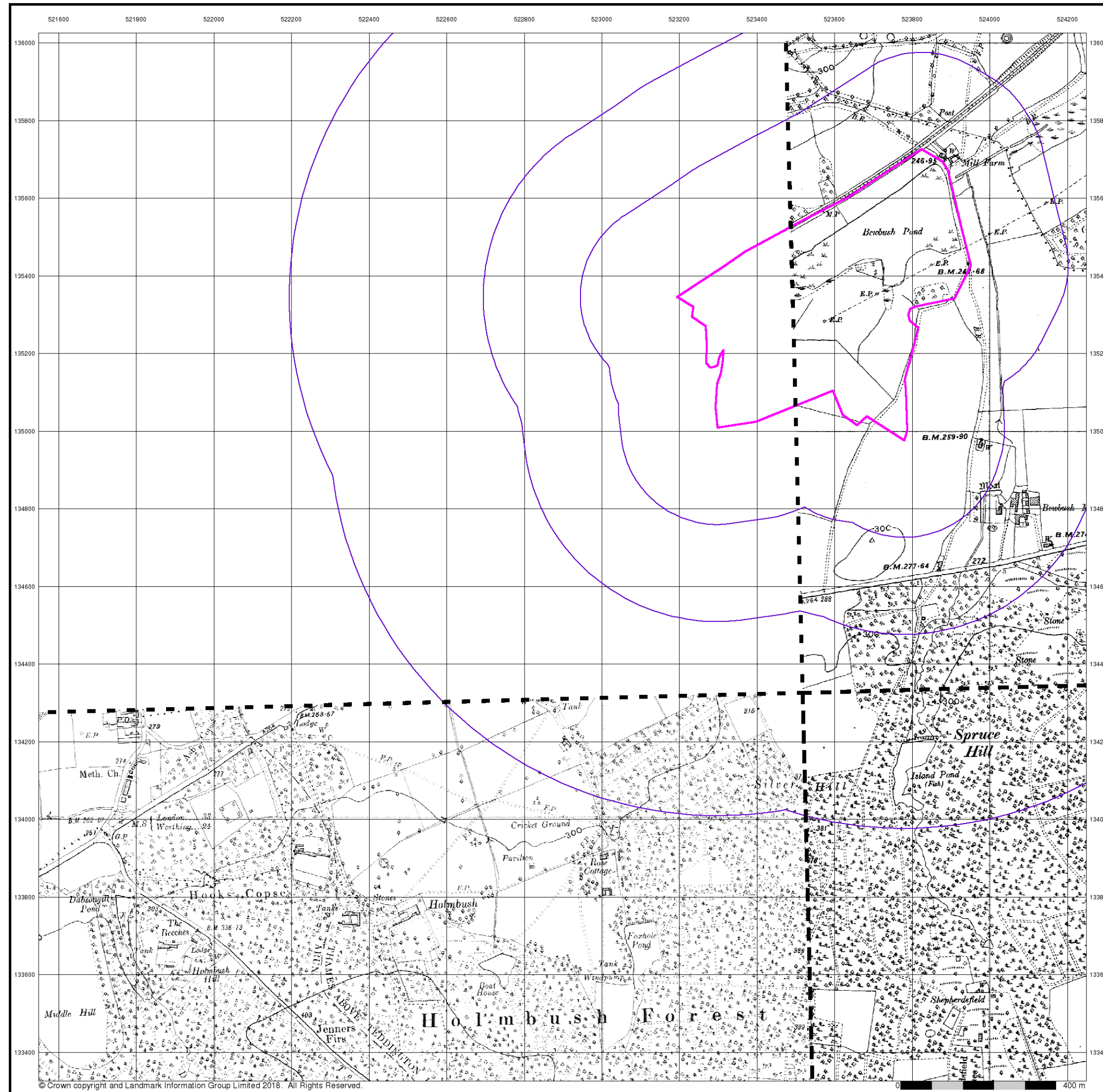


Historical Map - Slice A



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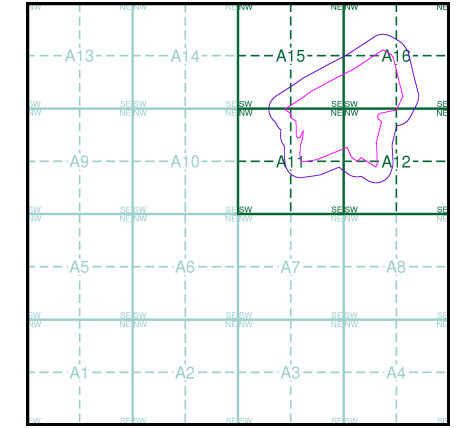
Sussex
Published 1938 - 1946
Source map scale - 1:10,560

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Map Name(s) and Date(s)

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014NW	014NE	1938	1946
1:10,560	1:10,560		

Historical Map - Slice A



Order Details

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Site Details

Site at 523573,135351

Historical Aerial Photography

Published 1947

Source map scale - 1:10,560

The Historical Aerial Photos were produced by the Ordnance Survey at a scale of 1:1,250 and 1:10,560 from Air Force photography. They were produced between 1944 and 1951 as an interim measure, pending preparation of conventional mapping, due to post war resource shortages. New security measures in the 1950's meant that every photograph was re-checked for potentially unsafe information with security sites replaced by fake fields or clouds. The original editions were withdrawn and only later made available after a period of fifty years although due to the accuracy of the editing, without viewing both revisions it is not easy to spot the edits. Where available Landmark have included both revisions.

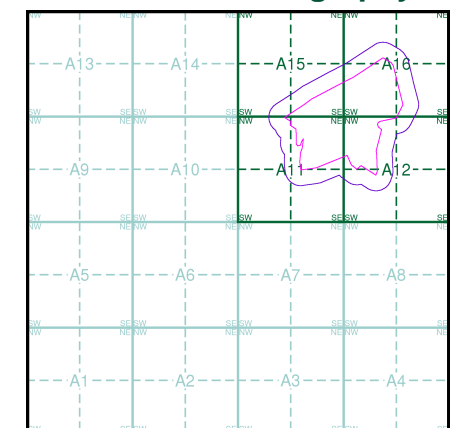
© Landmark Information Group and/or Data Suppliers 2010.

Map Name(s) and Date(s)

TQ23NW
1947
1:10,560

TQ23SW
1947
1:10,560

Historical Aerial Photography - Slice A

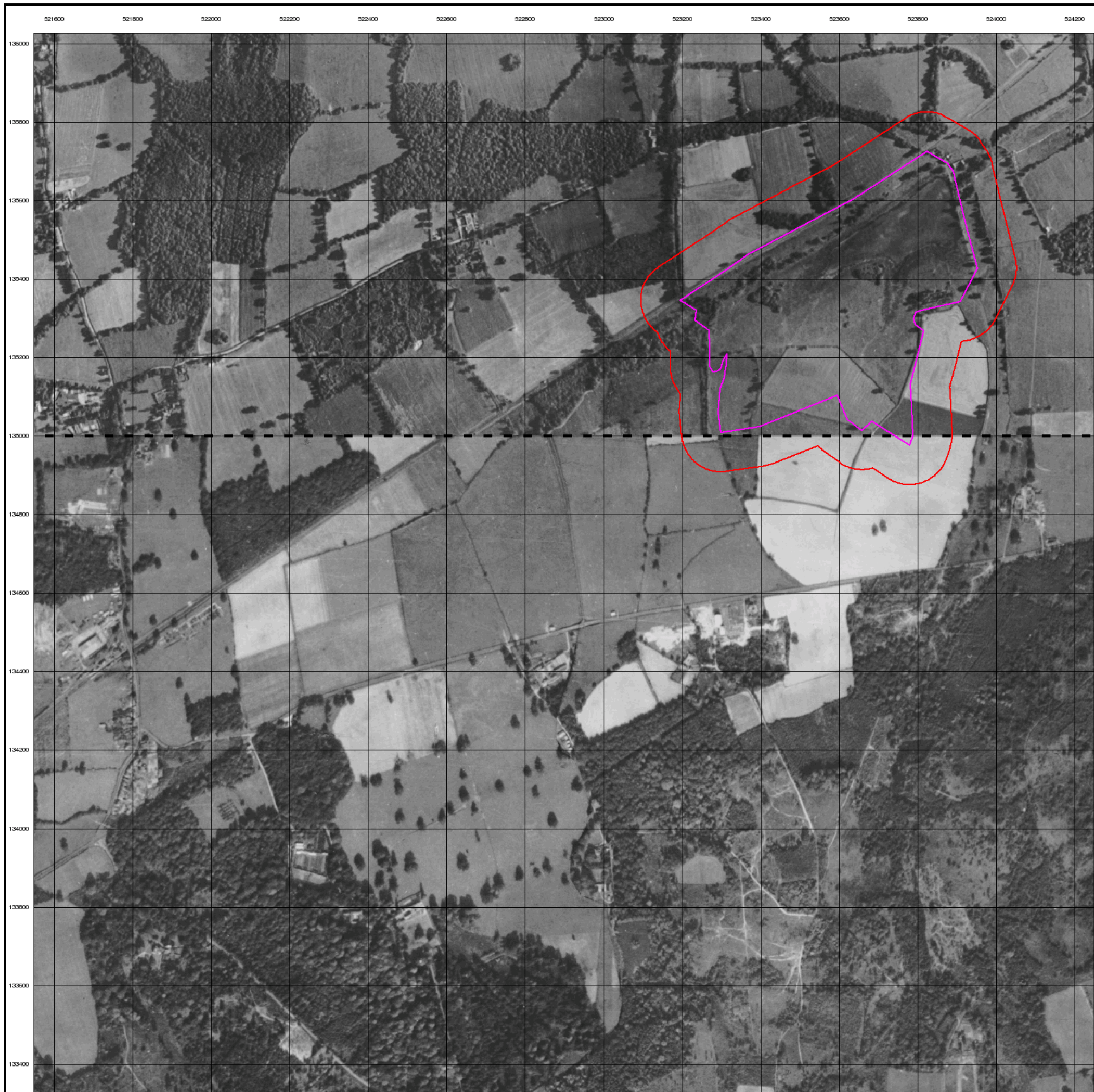


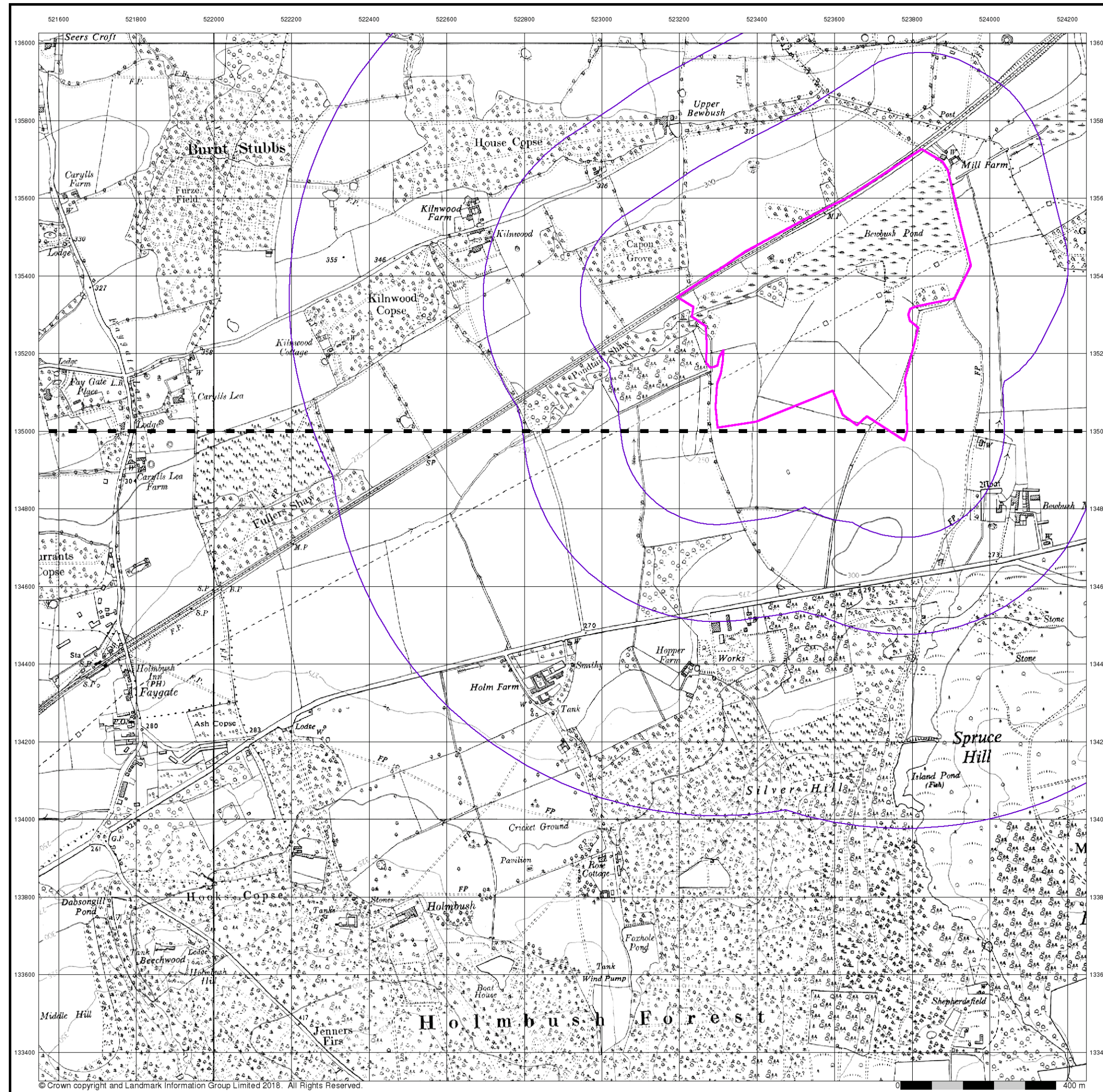
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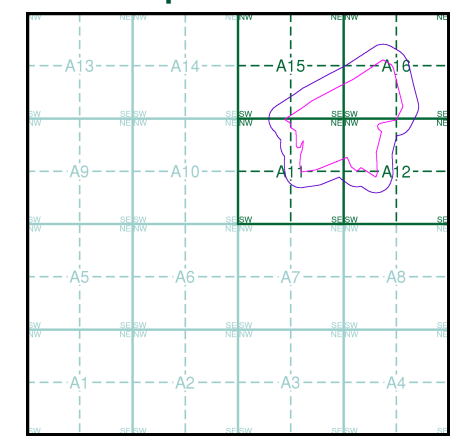
Ordnance Survey Plan
Published 1961 - 1963
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

---	TQ23NW	1961
---	1:10,560	
---	TQ23SW	1963
---	1:10,560	

Historical Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351



Tel: 0844 844 9952
 Fax: 0844 844 9951
 Web: www.envirocheck.co.uk

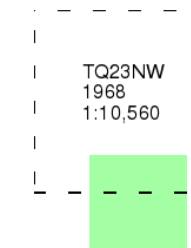
Ordnance Survey Plan

Published 1968

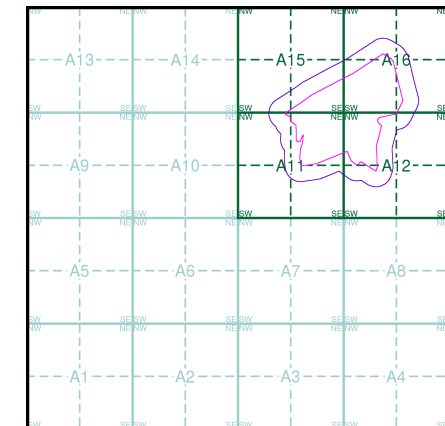
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A

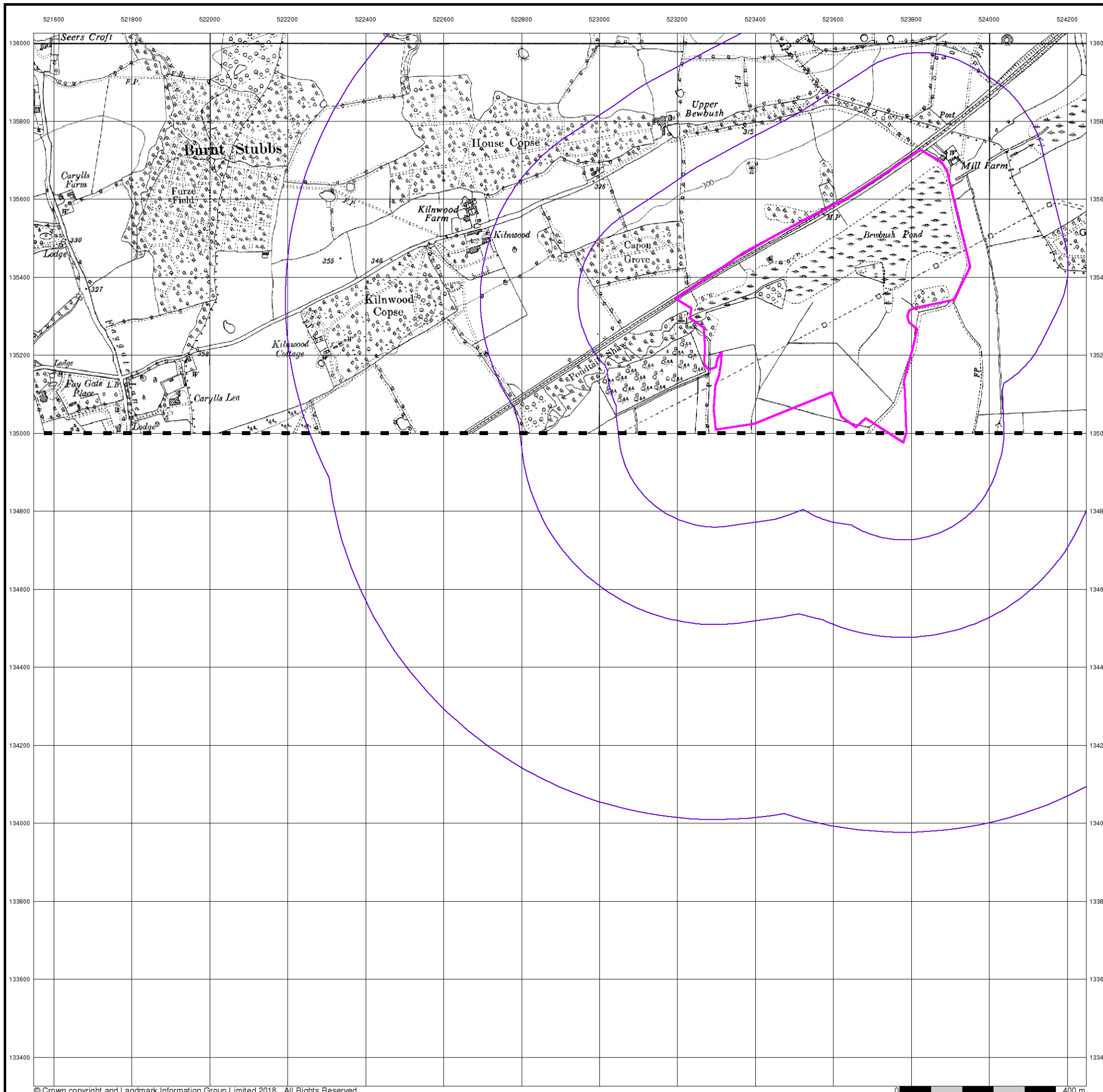


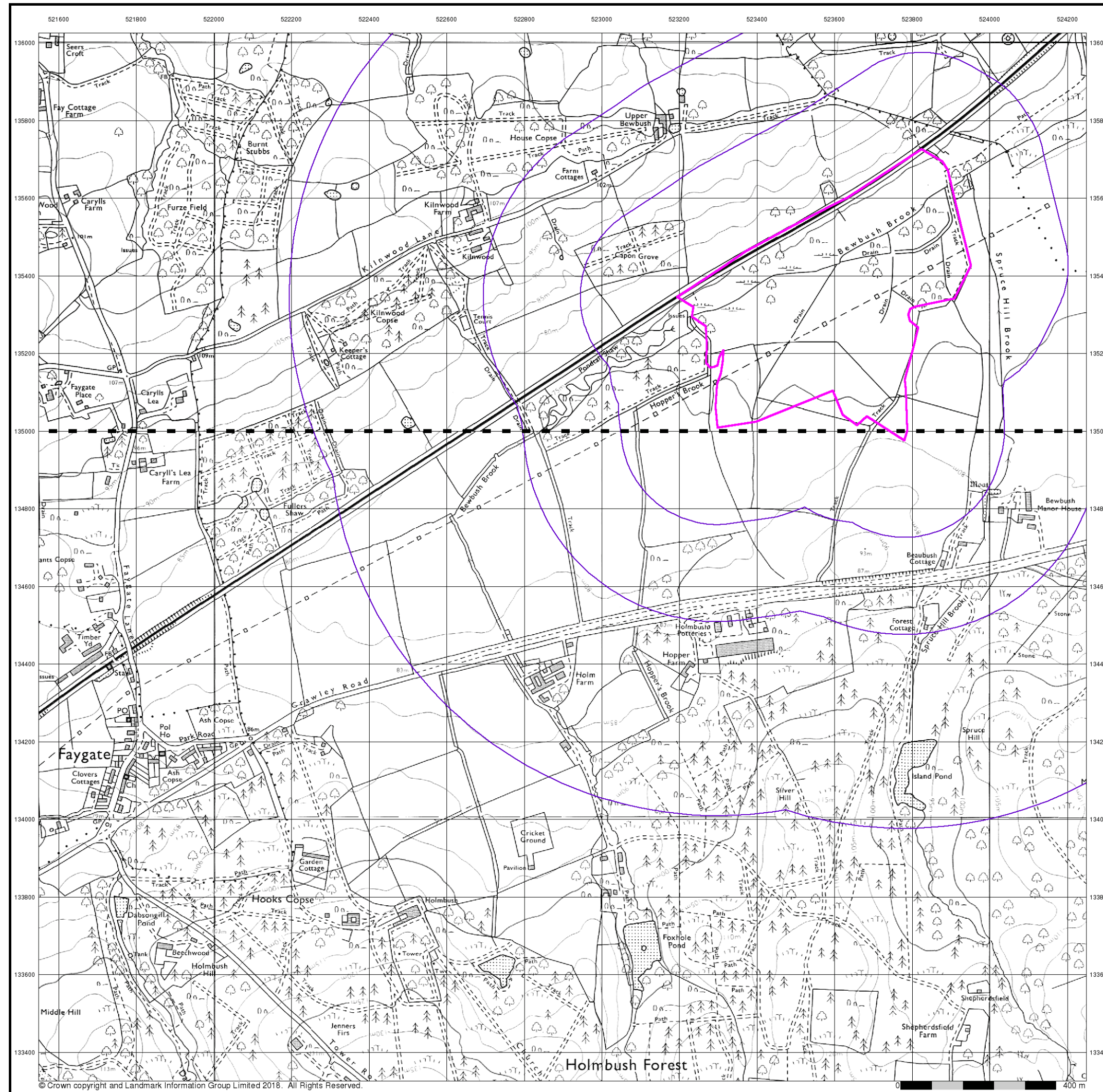
Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351





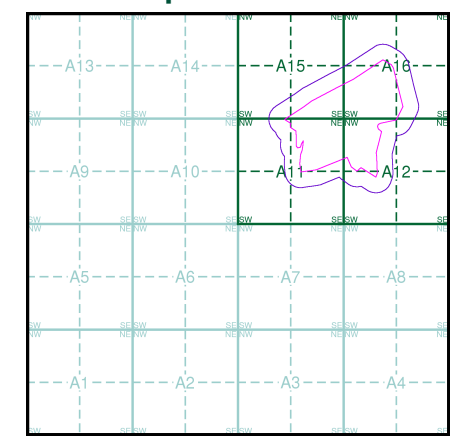
Ordnance Survey Plan
Published 1977 - 1979
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

TQ23NW	1979	1:10,000
TQ23SW	1977	1:10,000

Historical Map - Slice A

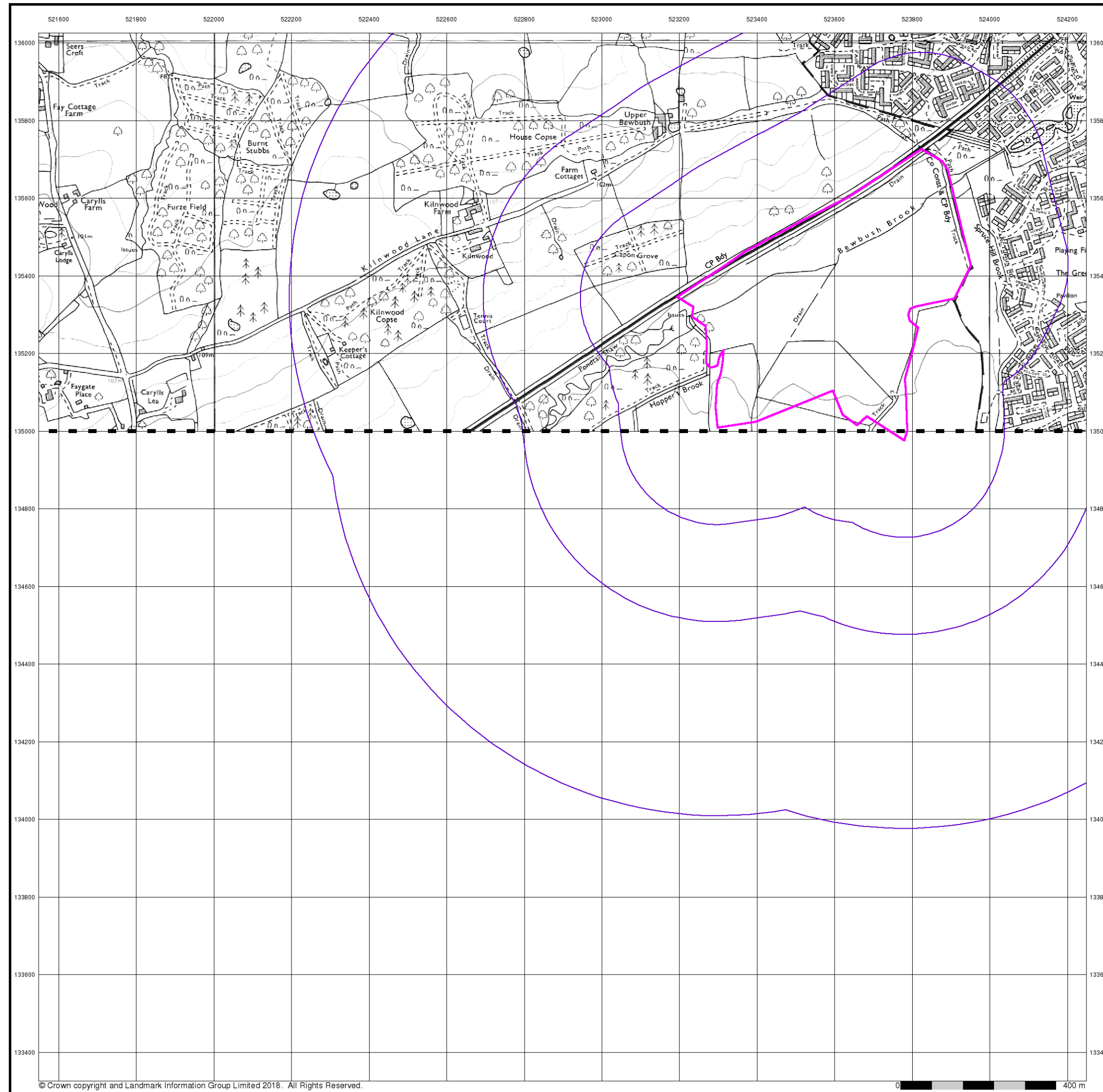


Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

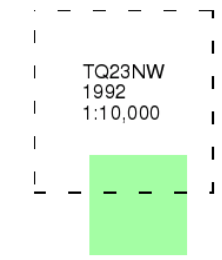
Site at 523573,135351



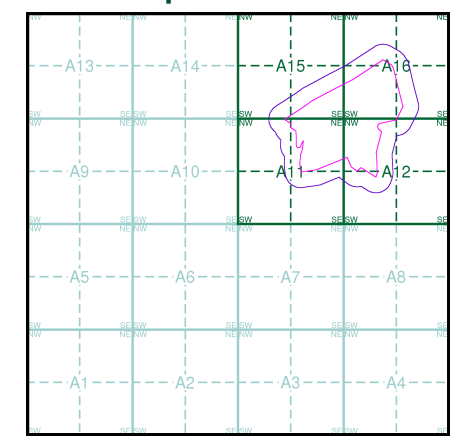
Ordnance Survey Plan
Published 1992
Source map scale - 1:10,000

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840's. In 1854 the 1:2,500 scale was adopted for mapping urban areas; these maps were used to update the 1:10,560 maps. The published date given therefore is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas. In the late 1940's, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A

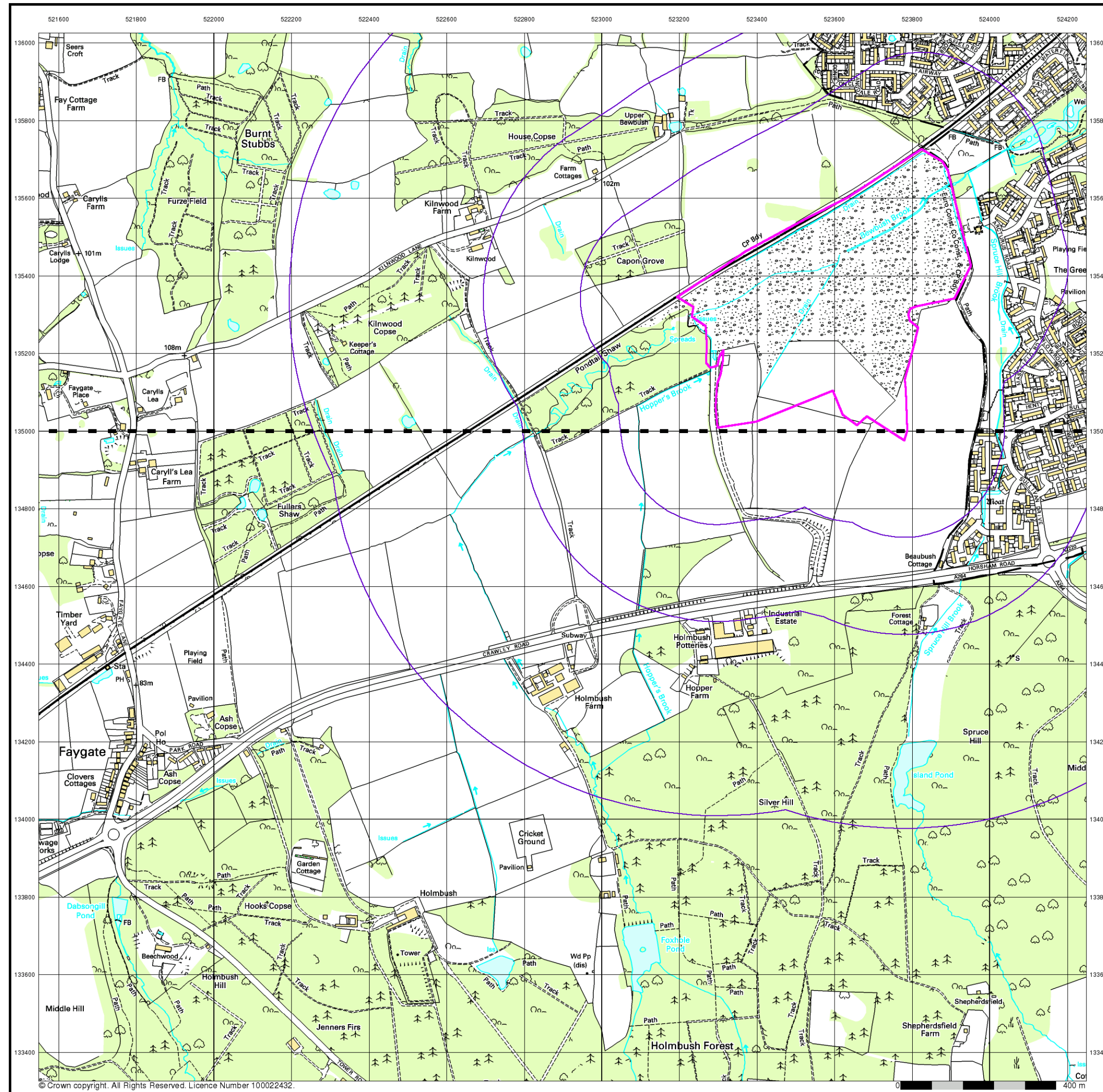


Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351



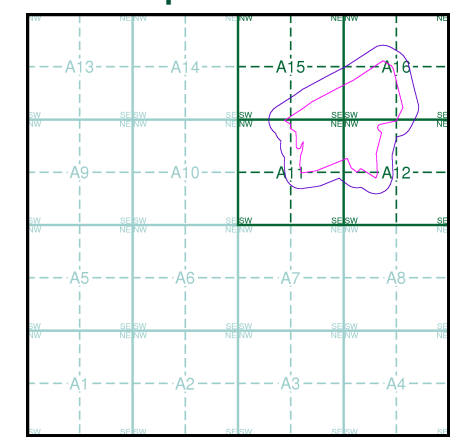
10k Raster Mapping
Published 1999 - 2000
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

---	TQ23NW	
---	1999	
---	1:10,000	
---	TQ23SW	
---	2000	
---	1:10,000	

Historical Map - Slice A

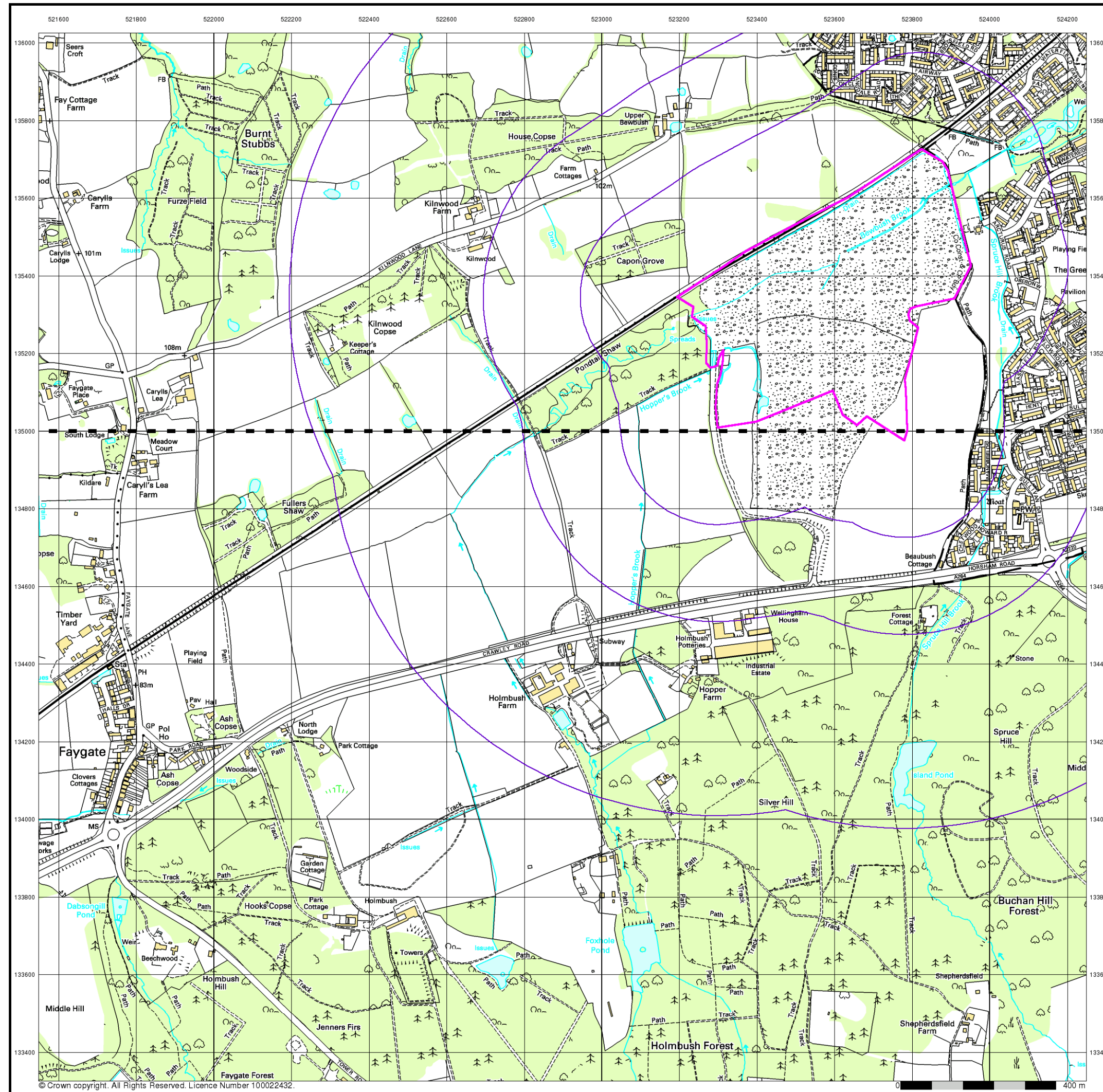


Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351



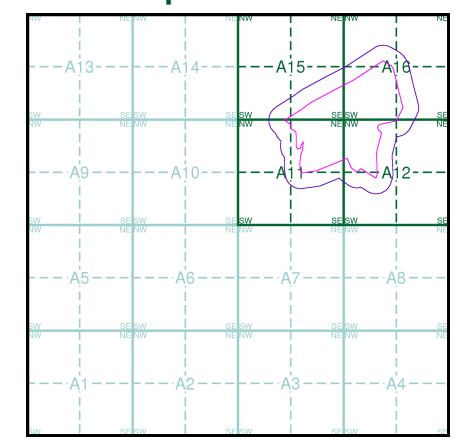
10k Raster Mapping
Published 2006
Source map scale - 1:10,000

The historical maps shown were produced from the Ordnance Survey's 1:10,000 colour raster mapping. These maps are derived from Landplan which replaced the old 1:10,000 maps originally published in 1970. The data is highly detailed showing buildings, fences and field boundaries as well as all roads, tracks and paths. Road names are also included together with the relevant road number and classification. Boundary information depiction includes county, unitary authority, district, civil parish and constituency.

Map Name(s) and Date(s)

TQ23NW	2006	1:10,000
TQ23SW	2006	1:10,000

Historical Map - Slice A

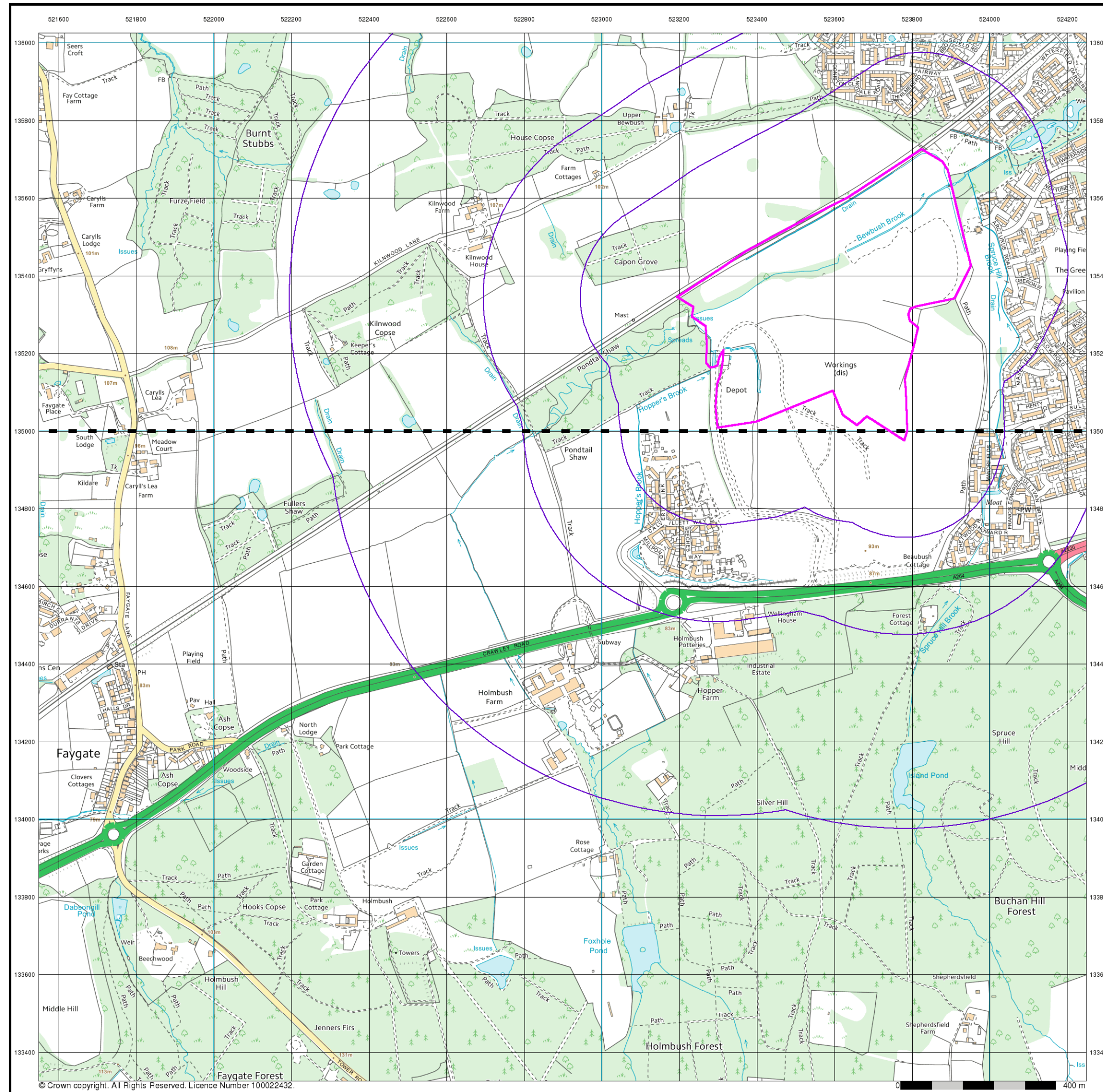


Order Details

Order Number: 155682781_1_1
Customer Ref: 66444
National Grid Reference: 523300, 135060
Slice: A
Site Area (Ha): 31.68
Search Buffer (m): 1000

Site Details

Site at 523573,135351



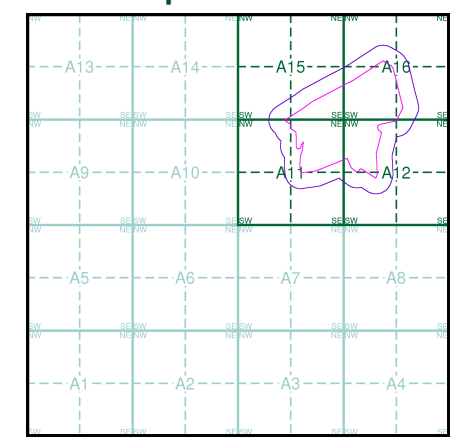
VectorMap Local
Published 2017
Source map scale - 1:10,000

VectorMap Local (Raster) is Ordnance Survey's highest detailed 'backdrop' mapping product. These maps are produced from OS's VectorMap Local, a simple vector dataset at a nominal scale of 1:10,000, covering the whole of Great Britain, that has been designed for creating graphical mapping. OS VectorMap Local is derived from large-scale information surveyed at 1:1250 scale (covering major towns and cities), 1:2500 scale (smaller towns, villages and developed rural areas), and 1:10 000 scale (mountain, moorland and river estuary areas).

Map Name(s) and Date(s)

- TQ23NW | 2017 | Variable
- TQ23SW | 2017 | Variable

Historical Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573,135351

Appendix D

Envirocheck report and mapping

Envirocheck data for slices B to D are included electronically

Envirocheck[®] Report:

Datasheet

Order Details:

Order Number:

155682781_1_1

Customer Reference:

66444

National Grid Reference:

523300, 135060

Slice:

A

Site Area (Ha):

31.68

Search Buffer (m):

1000

Site Details:

Site at 523573,135351

Client Details:

Ms K Brady
ESI Ltd
New Zealand House
160 Abbey Foregate
Shrewsbury
Shropshire
SY2 6FD

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	24
Hazardous Substances	-
Geological	29
Industrial Land Use	37
Sensitive Land Use	44
Data Currency	46
Data Suppliers	51
Useful Contacts	52

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination. For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client. In the attached datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Radon Potential dataset Copyright Notice

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes	Yes	Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 3	1	1	2	14
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices					
Integrated Pollution Controls					
Integrated Pollution Prevention And Control					
Local Authority Integrated Pollution Prevention And Control					
Local Authority Pollution Prevention and Controls	pg 7				1
Local Authority Pollution Prevention and Control Enforcements					
Nearest Surface Water Feature	pg 7	Yes			
Pollution Incidents to Controlled Waters	pg 7	1	1	2	2
Prosecutions Relating to Authorised Processes					
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
Substantiated Pollution Incident Register	pg 8			1	
River Quality Chemistry Sampling Points					
Water Abstractions	pg 8				1
Water Industry Act Referrals					
Groundwater Vulnerability	pg 9	Yes	n/a	n/a	n/a
Drift Deposits			n/a	n/a	n/a
Bedrock Aquifer Designations	pg 9	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 9	Yes	n/a	n/a	n/a
Source Protection Zones					
Extreme Flooding from Rivers or Sea without Defences	pg 9	Yes	Yes	n/a	n/a
Flooding from Rivers or Sea without Defences	pg 10	Yes	Yes	n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 10	22	29	32	35

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites					
Historical Landfill Sites	pg 24	1		1	1
Integrated Pollution Control Registered Waste Sites					
Licensed Waste Management Facilities (Landfill Boundaries)	pg 24	1			
Licensed Waste Management Facilities (Locations)	pg 24				2
Local Authority Landfill Coverage		2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 25	1			2
Potentially Infilled Land (Non-Water)	pg 25				2
Potentially Infilled Land (Water)	pg 25	2		1	2
Registered Landfill Sites	pg 26	2	1		
Registered Waste Transfer Sites					
Registered Waste Treatment or Disposal Sites	pg 27	1	1		
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)					
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)					
Planning Hazardous Substance Consents					
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 29	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 29	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 33		1		2
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability	pg 34	Yes	n/a	n/a	n/a
Man-Made Mining Cavities	pg 34			1	
Natural Cavities					
Non Coal Mining Areas of Great Britain	pg 34	Yes		n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 34	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 34	Yes		n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 35	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 35	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 35	Yes		n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 37		4	12	18
Fuel Station Entries					
Points of Interest - Commercial Services	pg 40		1	1	4
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 40				3
Points of Interest - Public Infrastructure	pg 40	2	1	1	
Points of Interest - Recreational and Environmental	pg 41		10	16	
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland	pg 44	1	1	5	14
Areas of Adopted Green Belt					
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty	pg 45			1	
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves					
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 45	1			
Ramsar Sites					
Sites of Special Scientific Interest	pg 45			1	1
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A11NE (N)	0	1	523400 135300
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NW (NW)	0	1	523150 135250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NE (NE)	0	1	523500 135200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A11NE (N)	0	1	523300 135250
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NE (NE)	0	1	523450 135150
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12NW (E)	0	1	523850 135200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A16SW (NE)	0	1	523800 135500
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NE (N)	0	1	523300 135350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A11NE (NE)	0	1	523450 135350
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A12NW (NE)	0	1	523650 135350
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A15SE (N)	0	1	523350 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A15SE (N)	0	1	523450 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16SW (NE)	0	1	523800 135600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A16SW (NE)	0	1	523850 135650
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A16SE (NE)	53	1	524000 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A11NW (W)	75	1	523200 135063
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A11NW (NW)	94	1	523150 135200
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A11SW (SW)	100	1	523200 135000
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12NE (E)	123	1	524050 135063
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16SE (NE)	150	1	524100 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A11NW (W)	206	1	523050 135150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A15NW (N)	242	1	523150 135750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A11NW (W)	244	1	523000 135100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A12SE (SE)	263	1	523950 134700
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A16NW (NE)	275	1	523750 136000
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NW (W)	285	1	522950 135150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A11NW (W)	329	1	522900 135150
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(NE)	334	1	523900 136050
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(E)	349	1	524300 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	A8NW (SE)	383	1	523850 134600
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NW (SE)	395	1	523900 134600
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(NE)	414	1	524000 136100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding of Property Situated Below Ground Level	A8NE (SE)	424	1	524050 134650
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A10NE (W)	441	1	522800 135100
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	(E)	449	1	524400 135450
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(E)	454	1	524400 135500
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	(NE)	465	1	524400 135550
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	(E)	481	1	524300 135050
	BGS Groundwater Flooding Susceptibility Flooding Type: Potential for Groundwater Flooding to Occur at Surface	(E)	499	1	524450 135100
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	(E)	499	1	524450 135400

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	<p>Discharge Consents</p> <p>Operator: Maj E Culvert Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Home Farm, Holmbush Estate, Faygate, Sussex Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctcp.0555 Permit Version: 1 Effective Date: 15th November 1966 Issued Date: 15th November 1966 Revocation Date: 3rd February 1989 Discharge Type: Discharge Of Other Matter-Fish Farm Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield Brook, Trib Of Rmole Status: Authorisation revokedRevoked Positional Accuracy: Located by supplier to within 100m</p>	A15SE (NE)	0	2	523500 135400
2	<p>Discharge Consents</p> <p>Operator: John Mowlem Homes Ltd Property Type: DOMESTIC PROPERTY (MULTIPLE) (INCL FARM HOUSES) Location: Bewbush Manor, Bewbush, Crawley, West Sussex Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.3241 Permit Version: 1 Effective Date: 20th April 1989 Issued Date: 20th April 1989 Revocation Date: 22nd July 1994 Discharge Type: Discharge Of Other Matter-Surface Water Discharge: Freshwater Stream/River Environment: Receiving Water: Spruce Hillbrook Status: Authorisation revokedRevoked Positional Accuracy: Located by supplier to within 10m</p>	A12SE (E)	223	2	524010 135000
3	<p>Discharge Consents</p> <p>Operator: Crawley Borough Council Property Type: Undefined Or Other Location: Beaubush Manor House, Crawley, Sussex Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTCU.0742 Permit Version: 1 Effective Date: 15th December 1976 Issued Date: 15th December 1976 Revocation Date: 7th March 2002 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Into Land Environment: Receiving Water: Weald Clay Strata Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 100m</p>	A12SE (E)	329	2	524100 134900
4	<p>Discharge Consents</p> <p>Operator: Maltaward Ltd Civil Engineers Property Type: REAL ESTATE ACTIVITIES/BUYING/SELLING/RENTING Location: Maltaward Ltd Civil Engineers Wellington House Holmbush Potteries Crawley Road, Faygate Horsham, West Sussex Rh12 4se Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Casm.1414 Permit Version: 1 Effective Date: 8th December 2005 Issued Date: 12th December 2005 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield Brook Status: New Consent (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A7NE (S)	491	2	523410 134530

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	<p>Discharge Consents</p> <p>Operator: Burrwill Moulds Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTWC.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: A N C Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Clive Barford Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Lynx Auto Centre Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	<p>Discharge Consents</p> <p>Operator: Ocean Air Distribution Limited Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Shaws Glass Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Wb Floor Machines Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Travis Perkins Trading Co Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	<p>Discharge Consents</p> <p>Operator: Wickhams Brown Ltd Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Ctwc.2423 Permit Version: 1 Effective Date: 9th May 1988 Issued Date: 9th May 1988 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield(Hoppers) Brook Status: Transferred from COPA 1974 Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	501	2	523100 134550
5	<p>Discharge Consents</p> <p>Operator: Tarmac Aggregates Limited Property Type: MAKING OF GLASS/CERAMICS/CEMENT/CUTTING STONE Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CNTM.0260 Permit Version: 1 Effective Date: 19th May 1992 Issued Date: 19th May 1992 Revocation Date: 2nd November 2009 Discharge Type: Trade Discharge - Process Water Discharge: Freshwater Stream/River Environment: Receiving Water: Ifield (Hoppers) Brook Status: Revoked (Water Resources Act 1991, Section 88 & Schedule 10 as amended by Environment Act 1995) Positional Accuracy: Located by supplier to within 10m</p>	A7NW (S)	514	2	523090 134540
6	<p>Discharge Consents</p> <p>Operator: Bernard J Newman & Co Ltd Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Stw, Holmbush Potteries, Faygate, Sussex Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Cctr.1139 Permit Version: 1 Effective Date: 8th December 1969 Issued Date: 8th December 1969 Revocation Date: 8th May 1988 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Millstream, Ifield Brk Status: Authorisation revokedRevoked Positional Accuracy: Located by supplier to within 100m</p>	A7NW (S)	519	2	523200 134500
7	<p>Discharge Consents</p> <p>Operator: Mr Harry Calvert, Holmbush Farm World Property Type: FOOD+BEVERAGE SERVICES/CAFE/RESTAURANT/PUB Location: Holmbush Farm World Crawley Road Faygate Horsham West Sussex Rh12 4se Authority: Environment Agency, Thames Region Catchment Area: Not Supplied Reference: Casm.1500 Permit Version: 1 Effective Date: 23rd October 2006 Issued Date: 30th November 2006 Revocation Date: 17th July 2015 Discharge Type: Sewage And Trade Combined - Unspecified Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Ifield(Hoppers)Brook Status: Authorisation revokedRevoked Positional Accuracy: Located by supplier to within 10m</p>	A6NE (SW)	771	2	522790 134430

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	<p>Discharge Consents</p> <p>Operator: Mr. H. C. Calvert Property Type: DOMESTIC PROPERTY (SINGLE) (INCL FARM HOUSE) Location: Cosira Complex, Holm Farm, Holmbush, Faygate, Near Horsham, Surrey Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTWC.2766 Permit Version: 1 Effective Date: 27th August 1988 Issued Date: 27th August 1988 Revocation Date: 23rd October 2006 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Ifield (Hoppers)Brook Status: Revoked: New Consent issued (Water Act 1989, Section 113) Positional Accuracy: Located by supplier to within 100m</p>	A6NE (SW)	788	2	522800 134400
8	<p>Discharge Consents</p> <p>Operator: Mr E. Calvert Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Stw, Rose Cottage, Faygate, Horsham, Sussex Authority: Environment Agency, Thames Region Catchment Area: Not Given Reference: CTCR.1465 Permit Version: 1 Effective Date: 8th October 1975 Issued Date: 8th October 1975 Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge: Freshwater Stream/River Environment: Receiving Water: Trib Of Ifield Brook Status: Transferred from Rivers (Prevention of Pollution) Act 1951-1961 Positional Accuracy: Located by supplier to within 100m</p>	A7SW (SW)	818	2	522900 134295
9	<p>Local Authority Pollution Prevention and Controls</p> <p>Name: Lafarge Redland Aggregates Ltd Location: Burns Way, Holmbush Potteries Industrial Estate, Faygate, HORSHAM, West Sussex, RH12 4ST Authority: Horsham District Council, Environmental Health Department Permit Reference: Epa/12 Dated: 24th March 1993 Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement Status: Permitted Positional Accuracy: Manually positioned to the road within the address or location</p>	A7NE (S)	556	3	523347 134456
	Nearest Surface Water Feature	A16SW (NE)	0	-	523614 135454
10	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: Bewbush Landfill Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed incident Incident Date: 4th March 1999 Incident Reference: THSE1999042754 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A16SW (NE)	0	2	523600 135500
11	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: BEWBUSH Authority: Environment Agency, Thames Region Pollutant: Unknown Sewage Note: Not Supplied Incident Date: 12th August 1996 Incident Reference: SE960411 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A12NE (E)	160	2	524040 135250

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: CRAWLEY Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 23rd May 1992 Incident Reference: S1920239 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A16SE (NE)	259	2	524200 135500
13	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: BEWBUSH Authority: Environment Agency, Thames Region Pollutant: Miscellaneous - Other Note: Not Supplied Incident Date: Not Supplied Incident Reference: SE960391 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m</p>	A16NE (NE)	334	2	524200 135800
14	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: FAYGATE Authority: Environment Agency, Thames Region Pollutant: Chemicals - Unknown Note: Confirmed As A Pollution Incident Incident Date: 4th May 1989 Incident Reference: S1890195 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m</p>	A7NE (S)	519	2	523400 134500
14	<p>Pollution Incidents to Controlled Waters</p> <p>Property Type: Not Given Location: FAYGATE Authority: Environment Agency, Thames Region Pollutant: Oils - Unknown Note: Confirmed As A Pollution Incident Incident Date: 8th May 1989 Incident Reference: S1890212 Catchment Area: Not Given Receiving Water: Not Given Cause of Incident: Not Given Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m</p>	A7NE (S)	524	2	523400 134495
15	<p>Substantiated Pollution Incident Register</p> <p>Authority: Environment Agency - Southern Region, Solent and South Downs Incident Date: 6th July 2015 Incident Reference: 1352375 Water Impact: Category 2 - Significant Incident Air Impact: Category 4 - No Impact Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Other Pollutant</p>	A16NE (NE)	326	2	524194 135794
16	<p>Water Abstractions</p> <p>Operator: Mr H C Calvert Licence Number: 28/39/32/0078 Permit Version: 100 Location: Tributary Of The River Mole At Holmbush Farm, Faygate, Horsh Authority: Environment Agency, Thames Region Abstraction: General Agriculture: Make-Up Or Top Up Water Abstraction Type: Water may be abstracted from a single point Source: Surface Daily Rate (m3): 5455 Yearly Rate (m3): 9092 Details: Filling Reservoir At Holmbush Farm, Faygate, Horsham, Sussex Authorised Start: 01 November Authorised End: 31 March Permit Start Date: 23rd June 1987 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m</p>	A7SW (SW)	814	2	522900 134300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Soil Classification: Soils of Intermediate Leaching Potential (I1) - Soils which can possibly transmit a wide range of pollutants Map Sheet: Sheet 46 East Sussex Scale: 1:100,000	A11NW (NW)	0	2	523171 135299
	Groundwater Vulnerability Soil Classification: Not classified Map Sheet: Sheet 46 East Sussex Scale: 1:100,000	A11NE (NE)	0	2	523303 135063
	Drift Deposits None				
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A11NW (NW)	0	1	523124 135330
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A11NE (NE)	0	1	523303 135063
	Bedrock Aquifer Designations Aquifer Designation: Unproductive Strata	A11SE (S)	0	1	523303 135000
	Bedrock Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A11NW (NW)	0	1	523101 135235
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A11NE (N)	0	1	523257 135253
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A11NE (NE)	0	1	523468 135156
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A12NW (E)	0	1	523836 135268
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A11NE (N)	0	2	523265 135175
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	136	2	524040 135290
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	145	2	524045 135285
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	161	2	524055 135270
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	168	2	524060 135260
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	177	2	524065 135250
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	197	2	524055 135200
	Extreme Flooding from Rivers or Sea without Defences Type: Extent of Extreme Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12SE (E)	240	2	523980 134845

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A11NW (NW)	0	2	523185 135245
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	136	2	524040 135290
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	145	2	524045 135285
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	161	2	524055 135270
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	168	2	524060 135260
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	177	2	524065 135250
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12NE (E)	197	2	524055 135200
	Flooding from Rivers or Sea without Defences Type: Extent of Flooding from Rivers or Sea without Defences Flood Plain Type: Fluvial Models Boundary Accuracy: As Supplied	A12SE (E)	240	2	523980 134845
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
17	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 33.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523304 135121
18	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 12.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523314 135153
19	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 46.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523314 135153

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 54.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523277 135154
21	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 42.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523288 135163
22	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 12.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523332 135193
23	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523290 135205
24	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 46.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523290 135205
25	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523334 135205
26	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523282 135206
27	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 430.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Bewbush Brook Catchment Name: Thames Primacy: 1	A11NW (N)	0	4	523232 135298
28	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 443.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A15SE (N)	0	4	523371 135441

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
29	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 22.3 Watercourse Level: Underground Permanent: True Watercourse Name: Bewbush Brook Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523614 135454
30	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 173.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	0	4	523938 135462
31	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 306.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Bewbush Brook Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523634 135464
32	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 110.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	0	4	523281 135207
33	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523888 135629
34	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523888 135629
35	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 60.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523895 135634
36	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523895 135634
37	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 209.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SW (NE)	0	4	523753 135666

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
38	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 171.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (E)	0	4	523407 135100
39	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 795.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Bewbush Brook Catchment Name: Thames Primacy: 1	A11NW (NW)	1	4	523154 135224
40	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 5.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11NE (N)	10	4	523273 135152
41	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 231.5 Watercourse Level: Underground Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A11NE (NW)	15	4	523267 135150
42	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 133.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Spruce Hill Brook Catchment Name: Thames Primacy: 1	A16SE (NE)	49	4	523981 135538
43	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 118.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	49	4	523943 135665
44	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	56	4	523984 135529
45	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 668.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Spruce Hill Brook Catchment Name: Thames Primacy: 1	A12SE (E)	58	4	524018 135007
46	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 101.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12NE (E)	78	4	524026 135284

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
47	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 132.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NW (NE)	82	4	523899 135776
48	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 23.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	149	4	524026 135738
49	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12NE (E)	156	4	524028 135224
50	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 40.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	162	4	524057 135687
51	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	162	4	524045 135725
52	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	165	4	524067 135661
53	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 45.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16SE (NE)	165	4	524057 135687
54	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 48.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	171	4	524053 135730
55	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 49.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	171	4	524055 135727

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
56	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 41.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12NE (E)	174	4	524030 135174
57	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 295.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A11NW (W)	200	4	523095 135034
58	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	208	4	524100 135693
59	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	211	4	524102 135694
60	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 26.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	216	4	524099 135736
61	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 20.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	217	4	524099 135736
62	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 18.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	217	4	524089 135760
63	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 24.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	235	4	524116 135747
64	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 44.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	235	4	524106 135770

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
65	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 46.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	237	4	524116 135747
66	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 221.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12SE (E)	249	4	523985 134836
67	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 170.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	249	4	524138 135712
68	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	276	4	524147 135777
69	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 36.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	278	4	524142 135793
70	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 21.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	281	4	524156 135767
71	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	293	4	524162 135785
72	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 9.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	299	4	524169 135785
73	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 12.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	307	4	524175 135791

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 143.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A15SW (NW)	314	4	522901 135455
75	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 57.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	318	4	524187 135790
76	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 19.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	318	4	524187 135790
77	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 164.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NE (SE)	323	4	523957 134675
78	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.0 Watercourse Level: Underground Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A11SW (SW)	332	4	523101 134742
79	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 23.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	334	4	524198 135806
80	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 59.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A16NE (NE)	334	4	524196 135808
81	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	354	4	524221 135802
82	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 8.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A11SW (SW)	357	4	523099 134713

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
83	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 86.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A11SW (SW)	365	4	523095 134706
84	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 3.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11SW (SW)	365	4	523095 134706
85	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 39.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A11SW (SW)	368	4	523095 134703
86	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 38.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A16NE (NE)	374	4	524226 135841
87	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 368.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A7NW (SW)	390	4	523098 134671
88	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 34.9 Watercourse Level: Underground Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A7NW (SW)	410	4	523107 134648
89	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NE (SE)	420	4	523923 134582
90	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 418.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NW (SE)	427	4	523895 134543
91	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 117.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A14SE (NW)	435	4	522761 135376

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
92	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 35.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (W)	437	4	522859 135012
93	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 75.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A7NW (SW)	443	4	523102 134613
94	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (W)	467	4	522832 134991
95	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (W)	470	4	522829 134988
96	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 362.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (W)	473	4	522826 134987
97	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 95.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (W)	473	4	522826 134987
98	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 272.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10NE (W)	495	4	522773 135087
99	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 19.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10NE (W)	495	4	522780 135069
100	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 47.3 Watercourse Level: Underground Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A7NW (S)	514	4	523094 134538

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
101	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 54.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NE (SE)	533	4	524203 134652
102	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 7.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NE (SE)	536	4	524202 134646
103	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 17.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8NE (SE)	540	4	524201 134639
104	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 6.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12SE (E)	546	4	524240 134684
105	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 272.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A12SE (E)	548	4	524245 134687
106	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 256.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Hopper's Brook Catchment Name: Thames Primacy: 1	A7NW (S)	560	4	523089 134491
107	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 75.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7NW (S)	689	4	523051 134366
108	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 285.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (SW)	718	4	522644 134715
109	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 370.9 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SE (SW)	721	4	522630 134741

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
110	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7SW (SW)	755	4	522992 134320
111	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 133.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7SW (SW)	759	4	522988 134317
112	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 2.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	764	4	522746 134483
113	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 20.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	765	4	522746 134480
114	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 260.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A7SW (S)	767	4	523163 134254
115	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 53.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	773	4	522754 134462
116	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 46.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	773	4	522754 134462
117	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 209.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Island Pond Catchment Name: Thames Primacy: 1	A8SW (SE)	782	4	523792 134195
118	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 29.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	793	4	522777 134413

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
119	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 126.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	810	4	522748 134416
120	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6SE (SW)	837	4	522880 134285
121	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 5.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A6SE (SW)	841	4	522875 134283
122	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 22.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6SE (SW)	841	4	522875 134283
123	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 39.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A6SE (SW)	843	4	522879 134279
124	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 44.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6SE (SW)	850	4	522853 134286
125	OS Water Network Lines Watercourse Form: Lake Watercourse Length: 21.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7SW (SW)	857	4	522900 134250
126	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 51.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A14NW (NW)	861	4	522516 135875
127	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 70.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7SW (SW)	868	4	522907 134236

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
128	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 116.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 2	A7SW (S)	886	4	522946 134196
129	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 4.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A14NW (NW)	894	4	522506 135916
130	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 150.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A14NW (NW)	898	4	522506 135921
131	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 451.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A8SW (SE)	956	4	523826 134021
132	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 350.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A6NE (SW)	957	4	522584 134374
133	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 215.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A7SW (S)	960	4	522983 134103
134	OS Water Network Lines Watercourse Form: Inland river Watercourse Length: 223.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Thames Primacy: 1	A10SW (W)	970	4	522331 134891

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
135	<p>Historical Landfill Sites</p> <p>Licence Holder: Matthews Demolition and Excavations Limited Location: West of Bewbush, Crawley, West Sussex Name: Land off Horsham Road Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD10974 First Input Date: 31st December 1976 Last Input Date: 29th January 1989 Specified Waste: Deposited Waste included Inert Waste Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3800/8173 BGS Ref: Not Supplied Other Ref: 3/CE/90, WD27/82</p>	A11NE (NE)	0	2	523303 135063
136	<p>Historical Landfill Sites</p> <p>Licence Holder: Not Supplied Location: Bewbush, Crawley, West Sussex Name: Buchan Park Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD12640 First Input Date: 31st December 1970 Last Input Date: 31st December 1977 Specified Waste: Deposited Waste included Inert and Industrial Waste Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3800/8171 BGS Ref: Not Supplied Other Ref: WSX68, WD27/80</p>	A8NW (SE)	383	2	523873 134606
137	<p>Historical Landfill Sites</p> <p>Licence Holder: Not Supplied Location: Bewbush, Crawley, West Sussex Name: Holmbush Potteries Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD12636 First Input Date: 31st December 1965 Last Input Date: 31st December 1968 Specified Waste: Deposited Waste included Inert and Industrial Waste Type: EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: 3800/8172 BGS Ref: Not Supplied Other Ref: WD27/81, WSX69</p>	A7NE (S)	591	2	523387 134425
138	<p>Licensed Waste Management Facilities (Landfill Boundaries)</p> <p>Name: Holmbush Farm Landfill, Faygate Rh12 Licence Number: 83158 Location: Mr Heath Smith, Holmbush Farm, Crawley Road, Faygate, Crawley, West Sussex, RH12 4SE Licence Holder: Peter John Brown Authority: Environment Agency - Thames Region, South East Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Max Input Rate: Not Supplied Licence Status: Inactive Issued: 1st March 1991 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied</p>	A11NE (NE)	0	2	523407 135109
139	<p>Licensed Waste Management Facilities (Locations)</p> <p>Licence Number: 83159 Location: Holmbush Farm, A264 Crawley Road, Faygate, Crawley, West Sussex, RH12 4SE Operator Name: Peter John Brown Operator Location: Not Supplied Authority: Environment Agency - South East Region, Kent & South London Area Site Category: Physical Treatment Facilities Licence Status: Surrendered Issued: 26th February 1997 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 31st March 2014 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m</p>	A6SE (SW)	806	2	522855 134337

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
139	Licensed Waste Management Facilities (Locations) Licence Number: 83158 Location: Holmbush Farm, Crawley Road, Faygate, Crawley, West Sussex, RH12 4SE Operator Name: Peter John Brown Operator Location: Not Supplied Authority: Environment Agency - South East Region, Kent & South London Area Site Category: Landfills Taking Non-biodegradable Wastes (Not Construction) Licence Status: Surrendered Issued: 1st March 1991 Last Modified: 30th June 1997 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 16th January 2009 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A6SE (SW)	806	2	522855 134337
	Local Authority Landfill Coverage Name: Horsham District Council - Has supplied landfill data		0	3	523303 135063
	Local Authority Landfill Coverage Name: West Sussex County Council - Has supplied landfill data		0	5	523303 135063
	Local Authority Landfill Coverage Name: Crawley Borough Council - Has supplied landfill data		2	6	523949 134927
140	Local Authority Recorded Landfill Sites Location: Holmbush Farm, Crawley Road, Faygate Reference: CG/46/00 Authority: West Sussex County Council, Environment & Development Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A11NE (NE)	0	5	523408 135107
141	Local Authority Recorded Landfill Sites Location: Holmbush Potteries, Horsham Road, Faygate Reference: Not Supplied Authority: West Sussex County Council, Environment & Development Last Reported Status: Unknown Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A7NE (S)	534	5	523343 134477
142	Local Authority Recorded Landfill Sites Location: Buchan Hill Forest, Crawley Road, Faygate Reference: LB/20/71 Authority: West Sussex County Council, Environment & Development Last Reported Status: Not Supplied Types of Waste: Household, Clay, Subsoils Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	A8NW (SE)	589	5	523900 134400
143	Potentially Infilled Land (Non-Water) Bearing Ref: S Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1980	A7NE (S)	535	-	523438 134489
144	Potentially Infilled Land (Non-Water) Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1980	A8SW (SE)	788	-	523747 134190
145	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1879	A11NE (N)	0	-	523264 135243
146	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1968	A11NE (NE)	0	-	523494 135334
147	Potentially Infilled Land (Water) Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1968	A16NW (N)	324	-	523677 136014

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
148	<p>Potentially Infilled Land (Water)</p> <p>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1913</p>	A7SW (SW)	821	-	522905 134289
149	<p>Potentially Infilled Land (Water)</p> <p>Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1913</p>	A7SW (S)	930	-	522993 134131
150	<p>Registered Landfill Sites</p> <p>Licence Holder: P J Brown Licence Reference: WSX/L1/0118/2 Site Location: Holmbush Farm Landfill, Faygate, CRAWLEY, West Sussex, RH Licence Easting: Not Supplied Licence Northing: Not Supplied Operator Location: Bellwood, Bonwylchs Road, CRAWLEY, West Sussex, RH11 0LE Authority: Environment Agency - Thames Region, South East Area Site Category: Landfill Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year)</p> <p>Waste Source: No known restriction on source of waste Restrictions: Status: Operational as far as is knownOperational Dated: 15th November 1994 Preceded By: 3/CE/90 Licence: Superseded By: Not Given Licence: Positional Accuracy: Positioned by the supplier Boundary Accuracy: Good Authorised Waste: Brickwork/Mortar, Flint, Stone Excav. Road Metal (Planings) Glas/Pottery/China/Enamel/Ceramic/Etc Gravel, Nat.Occ. Rocks & Soils Reacted Concrete Incl.Steel Reinforc' Sand, Silica, Silt, Sub/Topsoil</p> <p>Prohibited Waste: Asbestos Bearing Mat'L Excav/Redev. Tips/Gasworks/Chem.Premis Max.Deposit Max.Waste Permitted By Licence Organohalogenes/Sub'S Likely Form Them Organophosphorus Cmpds Organotin Cpds Radioactive Mat'L Sub'S Harmful To Human Health Sub'S Likely To Pollute Environment Waste N.O.S. Waste With Ph < 6 Waste With Ph > 8</p>	A11NE (NE)	0	2	523303 135063
151	<p>Registered Landfill Sites</p> <p>Licence Holder: P J Brown (Haulage) Licence Reference: 3/CE/90 Site Location: Holmbush Farm Landfill, Faygate, CRAWLEY, West Sussex, RH Licence Easting: 523500 Licence Northing: 135480 Operator Location: 1 Perrylands Lane, Smallfield, HORLEY, Surrey, RH6 9PR Authority: Environment Agency - Thames Region, South East Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Record supersededSuperseded Dated: 1st March 1991 Preceded By: Not Given Licence: Superseded By: WSX/L1/0118/2 Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Brick,Cement,Concrete,Stone,Slate,Tile Chalk,Soils,Clay Other Totally Inert Wastes</p> <p>Prohibited Waste: Any Other Material Asbestos Cement Grass Cuttings Paper Vegetable Matter Waste - Water Poll'N Pot'L > Topsoil Waste Ex Any Site May Cont. Haz.Mat'L Waste Ex Any Site May Cont. Poll.Mat'L Waste-Old Tips,Gaswks,Sites Store.Chem Wood</p>	A15SE (NE)	0	2	523500 135480

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
152	<p>Registered Landfill Sites</p> <p>Licence Holder: Horsham & Crawley Tipper Licence Reference: 3/AX/80 Site Location: Land North Of A264, Bewbush, Crawley, West Sussex Licence Easting: 523800 Licence Northing: 135000 Operator Location: Columbia Works, Fleming Way, Crawley, West Sussex Authority: Environment Agency - Southern Region, Sussex Area Site Category: Landfill Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st December 1980 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Construction And Demolition Wastes Excavated Natural Materials \$ Road Making Materials</p>	A12SW (E)	13	2	523800 135000
153	<p>Registered Waste Treatment or Disposal Sites</p> <p>Licence Holder: P J Brown Licence Reference: WSX/L1/0174 Site Location: Holmbush Farm Soil Screener, Faygate, Crawley, West Sussex Operator Location: Bellwood, Bonwychs Road, CRAWLEY, West Sussex, RH11 0LE Authority: Environment Agency - Thames Region, South East Area Site Category: Treatment Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source: No known restriction on source of waste Restrictions: Licence Status: Operational as far as is knownOperational Dated: 26th February 1997 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Brickwork/Mortar, Flint, Stone Excav. Road Metal (Planings) Glas/Pottery/China/Enamel/Ceramic/Etc Gravel, Nat.Occ. Rocks & Soils Max.Waste Awaiting Treatment Max.Waste Permitted By Licence Reacted Concrete Incl.Steel Reinforc' Sand, Silica, Silt, Sub/Topsoil Prohibited Waste: Asbestos Bearing Mat'L Asbestos Cement Products Contaminated Material/Rubble Food Waste Liquid Wastes Radioactive Mat'L Sludge Wastes Spec.Waste (Epa'90:S62/1996 Regs) Sub'S Control. Radioactive Subs Act'60 Sub'S Harmful To Human Health Sub'S Likely To Pollute Environment Waste N.O.S. Waste With Ph < 6 Waste With Ph > 8 Wood, Paper, Plastics</p>	A11NE (NE)	0	2	523350 135100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
154	<p>Registered Waste Treatment or Disposal Sites</p> <p>Licence Holder: Matthews Demol'N & Excav'N Ltd Licence Reference: 3/BN/85 Site Location: North Of A264 At Bewbush, Crawley, West Sussex Operator Location: Columbia Works, Fleming Way, CRAWLEY, West Sussex, RH10 2NP Authority: Environment Agency - Southern Region, Sussex Area Site Category: Transfer Max Input Rate: Undefined Waste Source: No known restriction on source of waste Restrictions: Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 25th February 1985 Preceded By: Not Given Licence: Superseded By: Not Given Licence: Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Brick Rubble,Broken Concrete Stone,Chalk,Subsoil Totally Inert Solid Waste Prohibited Waste: Any Waste Not Totally Inert Asbestos Grass Cuttings Paper Vegetable Matter Waste Ex Sites Cont.Hazardous Material Waste Ex Sites Cont.Polluting Mater'L Wood</p>	A12NW (NE)	10	2	523800 135300

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Wealden Group	A11NE (NE)	0	1	523303 135063
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A12NW (E)	0	1	523836 135268
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A11NE (NE)	0	1	523468 135156
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A16SW (NE)	0	1	523624 135512
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A11NW (NW)	0	1	523101 135235
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A11NE (NE)	0	1	523303 135063
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Sediment Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 30 - 45 mg/kg	A11NW (NW)	0	1	523124 135330

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 25 - 35 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A11NE (N)	0	1	523257 135253
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 25 - 35 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A16SW (NE)	0	1	523788 135646
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A11NW (W)	73	1	523220 135052
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic <15 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A16SE (NE)	90	1	524024 135506
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A16SE (NE)	103	1	524015 135595
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A12SE (E)	143	1	524000 135000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A11NW (NW)	195	1	523000 135288
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A16SE (NE)	218	1	524141 135585
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 25 - 35 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A15NW (N)	271	1	523068 135742
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A11NW (W)	272	1	523000 135063
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A15NW (N)	302	1	523085 135915
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic <15 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A15NW (N)	489	1	523100 136023

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A10SE (W)	493	1	522823 134881
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic <15 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A8NW (SE)	510	1	523658 134380
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A8NW (SE)	555	1	523836 134424
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A14NE (NW)	575	1	522826 135809
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A14NE (NW)	731	1	522711 135913
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic <15 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A10SW (W)	777	1	522500 135000

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic <15 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A7SW (S)	785	1	523231 134162
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A8SW (SE)	833	1	523785 134144
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 30 - 45 mg/kg</p> <p>Concentration:</p>	A10SW (W)	833	1	522437 135000
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A3NE (S)	916	1	523273 133929
	<p>BGS Estimated Soil Chemistry</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Soil Sample Type: Sediment</p> <p>Arsenic 15 - 25 mg/kg</p> <p>Concentration:</p> <p>Cadmium <1.8 mg/kg</p> <p>Concentration:</p> <p>Chromium 60 - 90 mg/kg</p> <p>Concentration:</p> <p>Lead Concentration: <100 mg/kg</p> <p>Nickel 15 - 30 mg/kg</p> <p>Concentration:</p>	A3NE (S)	979	1	523305 134000
155	<p>BGS Recorded Mineral Sites</p> <p>Site Name: Pondtail Shaw Pits</p> <p>Location: Faygate, Horsham, West Sussex</p> <p>Source: British Geological Survey, National Geoscience Information Service</p> <p>Reference: 150502</p> <p>Type: Opencast</p> <p>Status: Ceased</p> <p>Operator: Not Supplied</p> <p>Operator Location: Not Supplied</p> <p>Periodic Type: Cretaceous</p> <p>Geology: Horsham Stone Member</p> <p>Commodity: Sandstone</p> <p>Positional Accuracy: Located by supplier to within 10m</p>	A11NW (NW)	166	1	523069 135239

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
156	BGS Recorded Mineral Sites Site Name: Hopper Farm Brick, Tile & Pottery Works Location: Holmbush Forest, Crawley, Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 126800 Type: Opencast Status: Ceased Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Cretaceous Geology: Weald Clay Formation Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A7NE (S)	605	1	523360 134408
157	BGS Recorded Mineral Sites Site Name: Island Pond Sand Pit Location: Buchan Country Park, Crawley, Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 126506 Type: Opencast Status: Ceased Operator: Not Supplied Operator Location: Not Supplied Periodic Type: Cretaceous Geology: Upper Tunbridge Wells Sand Commodity: Sand Positional Accuracy: Located by supplier to within 10m	A8SW (SE)	789	1	523755 134188
	BGS Measured Urban Soil Chemistry No data available				
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Mining Instability Mining Evidence: Inconclusive Iron Ore Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A11SE (S)	0	-	523303 135000
	Man-Made Mining Cavities Easting: 524200 Northing: 135600 Distance: 284 Quadrant Reference: A16 Quadrant Reference: SE Bearing Ref: NE Cavity Type: Multiple Bell Pits/Iron Workings Commodity: Iron Solid Geology Detail: Weald Clay Formation Superficial Geology: No Details Detail:	A16SE (NE)	284	7	524200 135600
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Non Coal Mining Areas of Great Britain Risk: Highly Unlikely Source: British Geological Survey, National Geoscience Information Service	A11NW (NW)	0	1	523124 135330
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	523257 135253
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Compressible Ground Stability Hazards Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	523257 135253
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	523366 135323
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A16NW (NE)	106	1	523666 135767
	Potential for Landslide Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A15NE (N)	162	1	523409 135725
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A12NW (E)	0	1	523836 135268
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523468 135156
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NE (N)	0	1	523257 135253
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11NW (W)	73	1	523220 135052
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A11SW (SW)	76	1	523224 135000
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A12NE (E)	143	1	524052 135145
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A16SE (NE)	218	1	524141 135585
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 135000
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A16SW (NE)	0	1	523624 135512
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A11NW (NW)	0	1	523101 135235

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A11NW (NW)	0	1	523124 135330
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A16SE (NE)	90	1	524024 135506
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 134998
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A11SE (S)	0	1	523303 134998
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A11NE (NE)	0	1	523303 135063

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
158	<p>Contemporary Trade Directory Entries</p> <p>Name: Clarks Location: 4, Orion Court, Bewbush, Crawley, West Sussex, RH11 6DG Classification: Car Breakdown & Recovery Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A16SE (NE)	69	-	523980 135595
159	<p>Contemporary Trade Directory Entries</p> <p>Name: G T Pest Services Location: 4, Ransome Close, Crawley, West Sussex, RH11 6AR Classification: Pest & Vermin Control Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12NE (E)	147	-	524054 135305
160	<p>Contemporary Trade Directory Entries</p> <p>Name: Jeffery Automotive Location: Thirlmere Rd, Ifield, Crawley, West Sussex, RH11 0ST Classification: Garage Services Status: Inactive Positional Accuracy: Manually positioned to the road within the address or location</p>	A16NW (NE)	150	-	523764 135862
161	<p>Contemporary Trade Directory Entries</p> <p>Name: Mrh Training Location: 14, Abbotsfield Road, Ifield, Crawley, West Sussex, RH11 0QT Classification: Mechanical Handling Equipment Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A16NW (NE)	237	-	523899 135950
162	<p>Contemporary Trade Directory Entries</p> <p>Name: Kelly'S Mgm Valeting Location: 57, Booth Road, CRAWLEY, West Sussex, RH11 6AG Classification: Carpet, Curtain & Upholstery Cleaners Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12NE (E)	256	-	524172 135296
163	<p>Contemporary Trade Directory Entries</p> <p>Name: C S M Autos Ltd Location: 24, Masefield Road, Crawley, RH11 6AP Classification: Car Dealers - Used Status: Active Positional Accuracy: Automatically positioned to the address</p>	A12NE (E)	288	-	524099 135126
164	<p>Contemporary Trade Directory Entries</p> <p>Name: Spic & Span Location: 15, Allcot Close, Crawley, West Sussex, RH11 6AN Classification: Cleaning Services - Commercial Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12NE (E)	304	-	524162 135173
165	<p>Contemporary Trade Directory Entries</p> <p>Name: P C-Tronics Location: 15, Neptune Close, Bewbush, Crawley, West Sussex, RH11 6BP Classification: Printers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A16SE (NE)	314	-	524219 135650
165	<p>Contemporary Trade Directory Entries</p> <p>Name: Pc-Tronics Location: 15, Neptune Close, Bewbush, Crawley, West Sussex, RH11 6BP Classification: Computer Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A16SE (NE)	314	-	524219 135650
166	<p>Contemporary Trade Directory Entries</p> <p>Name: Arrow Air Freight Location: 5, Howard Road, Crawley, West Sussex, RH11 8GF Classification: Airfreight Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12SE (SE)	314	-	523972 134729
166	<p>Contemporary Trade Directory Entries</p> <p>Name: P J Delivery & Logistics Location: 3, Chetwood Road, Crawley, West Sussex, RH11 8GB Classification: Road Haulage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A12SE (SE)	318	-	523944 134705
167	<p>Contemporary Trade Directory Entries</p> <p>Name: It Upgrade Ltd Location: 8, Peterlee Walk, Bewbush, Crawley, West Sussex, RH11 6ED Classification: Computer Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A12SE (E)	382	-	524165 134939

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
168	<p>Contemporary Trade Directory Entries</p> <p>Name: Powell Blinds Location: Sunblind House, Holmbush Potteries, Crawley Road, Faygate, Horsham, RH12 4SE Classification: Blinds, Awnings & Canopies Status: Active Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	490	-	523375 134525
168	<p>Contemporary Trade Directory Entries</p> <p>Name: Blackthorn Location: Sunblind House, Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Precision Engineers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	493	-	523377 134522
168	<p>Contemporary Trade Directory Entries</p> <p>Name: Powell Blinds Location: Sunblind House, Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	493	-	523377 134522
168	<p>Contemporary Trade Directory Entries</p> <p>Name: Holmbush Blinds Location: Sunblind House, Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Blinds, Awnings & Canopies Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	493	-	523377 134522
168	<p>Contemporary Trade Directory Entries</p> <p>Name: Lafarge Aggregates Ltd Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4FE Classification: Concrete & Mortar Ready Mixed Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A7NE (S)	516	-	523350 134496
169	<p>Contemporary Trade Directory Entries</p> <p>Name: Lafarge Readymix Ltd Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Concrete & Mortar Ready Mixed Status: Inactive Positional Accuracy: Automatically positioned in the proximity of the address</p>	A7NE (S)	502	-	523281 134508
169	<p>Contemporary Trade Directory Entries</p> <p>Name: Travis Perkins Plc Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Builders' Merchants Status: Active Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	502	-	523281 134508
170	<p>Contemporary Trade Directory Entries</p> <p>Name: Lynx Auto Centre Location: Unit 4, Burns Way, Holmbush Potteries Estate, Faygate, Horsham, RH12 4ST Classification: Garage Services Status: Active Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	572	-	523389 134444
170	<p>Contemporary Trade Directory Entries</p> <p>Name: Burrwill Precision Moulding Location: Unit 1-2, Burns Way, Holmbush Potteries Estate, Faygate, Horsham, RH12 4ST Classification: Plastics - Injection Moulding Status: Active Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	574	-	523426 134448
170	<p>Contemporary Trade Directory Entries</p> <p>Name: W B Floor Machines Ltd Location: Unit 7, Burns Way, Holmbush Potteries Estate, Faygate, Horsham, West Sussex, RH12 4ST Classification: Cleaning Materials & Equipment Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	576	-	523344 134435

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
170	<p>Contemporary Trade Directory Entries</p> <p>Name: W B Floor Machines Ltd Location: Unit 7, Burns Way, Holmbush Potteries Estate, Faygate, Horsham, West Sussex, RH12 4ST Classification: Cleaning Materials & Equipment Status: Active Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	576	-	523344 134435
171	<p>Contemporary Trade Directory Entries</p> <p>Name: Southern Insulation & Packaging Location: Unit 8, Burns Way, Holmbush Potteries Estate, Faygate, Horsham, West Sussex, RH12 4ST Classification: Packaging Materials Manufacturers & Suppliers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A7NE (S)	579	-	523320 134431
172	<p>Contemporary Trade Directory Entries</p> <p>Name: Forgehorns Ironwork Location: The Forge, Holmbush Farm, Crawley Rd, Faygate, Horsham, West Sussex, RH12 4SE Classification: Wrought Ironwork Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A6NE (SW)	758	-	522873 134382
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Intercleanse Pest Control Location: 3 The Courtyard, Holmbush Farm, Crawley Road, Faygate, RH12 4SE Classification: Pest & Vermin Control Status: Active Positional Accuracy: Automatically positioned to the address</p>	A6NE (SW)	785	-	522843 134371
173	<p>Contemporary Trade Directory Entries</p> <p>Name: West Sussex Gun Company Location: Unit 6, The Courtyard, Crawley Road, Faygate, Horsham, RH12 4SE Classification: Gunsmiths Status: Active Positional Accuracy: Automatically positioned to the address</p>	A6NE (SW)	794	-	522853 134352
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Multaward (Barriers) Ltd Location: Unit 7, The Courtyard, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Engineers - General Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A6SE (SW)	806	-	522855 134337
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Forgehorns Location: Holmbush Farm, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Gate Manufacturers Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A6SE (SW)	806	-	522855 134337
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Concord Location: Unit 3, The Courtyard, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Commercial Cleaning Services Status: Inactive Positional Accuracy: Automatically positioned to the address</p>	A6NE (SW)	808	-	522818 134360
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Precision Grinding Location: 12, Holm Bush Farm, Crawley Rd, Faygate, Horsham, West Sussex, RH12 4SE Classification: Precision Engineers Status: Inactive Positional Accuracy: Manually positioned to the address or location</p>	A6SE (SW)	813	-	522846 134334
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Travis Perkins Trading Co Ltd Location: Holmbush Farm, Crawley Rd, Faygate, Horsham, West Sussex, RH12 4SE Classification: Builders' Merchants Status: Inactive Positional Accuracy: Manually positioned within the geographical locality</p>	A6SE (SW)	820	-	522841 134329
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Tylines Road Marking Ltd Location: Unit 4, Crawley Rd, Faygate, Horsham, West Sussex, RH12 4SE Classification: Road Marking & Surfacing Equipment & Material Manufacturers Status: Inactive Positional Accuracy: Manually positioned within the geographical locality</p>	A6SE (SW)	820	-	522841 134329

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
173	<p>Contemporary Trade Directory Entries</p> <p>Name: Les Eggleton Precision Grinding Location: Unit 12, The Courtyard, Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Classification: Precision Engineers Status: Active Positional Accuracy: Automatically positioned to the address</p>	A6SE (SW)	821	-	522834 134333
174	<p>Points of Interest - Commercial Services</p> <p>Name: M P C Pest Control Location: 5 Langdale Road, Ifield, Crawley, RH11 0SS Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location</p>	A16NW (NE)	231	8	523678 135906
175	<p>Points of Interest - Commercial Services</p> <p>Name: P J Delivery & Logistics Location: 3 Chetwood Road, Crawley, RH11 8GB Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location</p>	A12SE (SE)	318	8	523944 134704
176	<p>Points of Interest - Commercial Services</p> <p>Name: Lynx Auto Centre Location: Unit 4 Burns Way, Holmbush Potteries Estate, Faygate, Horsham, RH12 4ST Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location</p>	A7NE (S)	578	8	523409 134441
177	<p>Points of Interest - Commercial Services</p> <p>Name: Forgehorns Location: Holmbush Farm, Crawley Road, Faygate, Horsham, RH12 4SE Category: Construction Services Class Code: Metalworkers Including Blacksmiths Positional Accuracy: Positioned to address or location</p>	A6SE (SW)	806	8	522855 134337
177	<p>Points of Interest - Commercial Services</p> <p>Name: Forgehorns Ironwork Location: Holmbush Farm, Crawley Road, Faygate, Horsham, RH12 4SE Category: Construction Services Class Code: Metalworkers Including Blacksmiths Positional Accuracy: Positioned to address or location</p>	A6SE (SW)	806	8	522855 134337
177	<p>Points of Interest - Commercial Services</p> <p>Name: Intercleanse Pest Control Ltd Location: Unit 2-3 The Courtyard, Crawley Road, Faygate, Horsham, RH12 4SE Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location</p>	A6NE (SW)	810	8	522824 134353
178	<p>Points of Interest - Manufacturing and Production</p> <p>Name: Industrial Estate Location: RH12 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location</p>	A7NE (S)	554	8	523325 134456
179	<p>Points of Interest - Manufacturing and Production</p> <p>Name: Holmbush Farm Location: Crawley Road, Faygate, Horsham, West Sussex, RH12 4SE Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location</p>	A6SE (SW)	806	8	522855 134337
179	<p>Points of Interest - Manufacturing and Production</p> <p>Name: Holmbush Farm Location: Holmbush Farm, Crawley Road, Faygate, Horsham, RH12 4SE Category: Farming Class Code: Livestock Farming Positional Accuracy: Positioned to address or location</p>	A6SE (SW)	813	8	522847 134334
180	<p>Points of Interest - Public Infrastructure</p> <p>Name: Refuse Tip Location: RH12 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location</p>	A11NE (NE)	0	8	523419 135306
181	<p>Points of Interest - Public Infrastructure</p> <p>Name: Refuse Tip Location: RH11 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location</p>	A16SW (NE)	0	8	523650 135410

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
182	<p>Points of Interest - Public Infrastructure</p> <p>Name: Refuse Tip Location: RH12 Category: Infrastructure and Facilities Class Code: Refuse Disposal Facilities Positional Accuracy: Positioned to an adjacent address or location</p>	A11SE (SE)	139	8	523552 134920
183	<p>Points of Interest - Public Infrastructure</p> <p>Name: Xylem Water Solutions UK Ltd Location: Holmbush Potteries, Crawley Road, Faygate, Horsham, RH12 4SE Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location</p>	A7NE (S)	493	8	523377 134522
184	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Play Area Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A16SE (NE)	12	8	523940 135521
185	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Keswick Close, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location</p>	A16NW (NE)	86	8	523841 135809
185	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A16NW (NE)	91	8	523856 135810
186	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A16NE (NE)	163	8	523948 135842
186	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Woodcroft Road, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location</p>	A16NE (NE)	163	8	523945 135843
187	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Play Area Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A12NE (E)	197	8	523984 135014
187	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Play Area Location: Manorfields, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location</p>	A12NE (E)	203	8	523989 135039
188	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A16NE (NE)	235	8	523918 135940
188	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Fairway, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location</p>	A16NE (NE)	235	8	523918 135941
188	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A16NW (NE)	261	8	523863 135983

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
188	Points of Interest - Recreational and Environmental Name: Playground Location: Abbotsfield Road, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NW (NE)	263	8	523867 135985
188	Points of Interest - Recreational and Environmental Name: Playground Location: Kittiwake Close, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NW (NE)	271	8	523807 135996
188	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A16NW (NE)	288	8	523780 136010
188	Points of Interest - Recreational and Environmental Name: Playground Location: Kittiwake Close, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NW (NE)	290	8	523780 136012
189	Points of Interest - Recreational and Environmental Name: Playground Location: Reedings, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NE (NE)	250	8	524011 135905
189	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A16NE (NE)	252	8	524013 135906
189	Points of Interest - Recreational and Environmental Name: Playground Location: Waterfield Gardens, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NE (NE)	328	8	524072 135958
189	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A16NE (NE)	331	8	524075 135959
190	Points of Interest - Recreational and Environmental Name: Playground Location: Sandpiper Close, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NW (NE)	296	8	523709 135998
190	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A16NW (N)	330	8	523622 135987
190	Points of Interest - Recreational and Environmental Name: Playground Location: Fairway, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location	A16NW (N)	332	8	523620 135988
191	Points of Interest - Recreational and Environmental Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location	A16NW (NE)	297	8	523710 135999

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
192	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A15NE (N)	305	8	523559 135916
192	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Coniston Close, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to address or location</p>	A15NE (N)	306	8	523558 135917
193	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Not Supplied Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A12NE (E)	313	8	524246 135321
193	<p>Points of Interest - Recreational and Environmental</p> <p>Name: Playground Location: Booth Road, RH11 Category: Recreational Class Code: Playgrounds Positional Accuracy: Positioned to an adjacent address or location</p>	A12NE (E)	313	8	524246 135321

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
194	Ancient Woodland Name: Rainbow Field Pond Tail & Shaw Reference: 1478090 Area(m ²): 28986.71 Type: Ancient and Semi-Natural Woodland	A11NW (NW)	0	9	523217 135249
195	Ancient Woodland Name: Capon Grove Reference: 1478089 Area(m ²): 31681.05 Type: Ancient and Semi-Natural Woodland	A15SW (N)	52	9	523220 135423
196	Ancient Woodland Name: Not Supplied Reference: 1478088 Area(m ²): 4629.68 Type: Ancient and Semi-Natural Woodland	A15SW (NW)	291	9	522927 135457
197	Ancient Woodland Name: House Coppice Reference: 1478570 Area(m ²): 91435.77 Type: Ancient and Semi-Natural Woodland	A15NW (NW)	365	9	523034 135704
198	Ancient Woodland Name: Not Supplied Reference: 1476422 Area(m ²): 57826.7 Type: Plantation on Ancient Woodland	A8NW (SE)	382	9	523872 134606
199	Ancient Woodland Name: Not Supplied Reference: 1478085 Area(m ²): 92131.35 Type: Ancient and Semi-Natural Woodland	A15NE (N)	390	9	523473 135989
200	Ancient Woodland Name: Island Shaw Pond Shaw Reference: 1478087 Area(m ²): 7719.73 Type: Ancient and Semi-Natural Woodland	(NE)	437	9	524256 135914
201	Ancient Woodland Name: Not Supplied Reference: 1476376 Area(m ²): 18722.85 Type: Ancient and Semi-Natural Woodland	(NE)	519	9	524455 135555
202	Ancient Woodland Name: Not Supplied Reference: 1478568 Area(m ²): 16216.58 Type: Ancient and Semi-Natural Woodland	A10NE (W)	544	9	522651 135321
203	Ancient Woodland Name: Not Supplied Reference: 1478578 Area(m ²): 54336.45 Type: Ancient and Semi-Natural Woodland	A8NE (SE)	559	9	524211 134608
204	Ancient Woodland Name: House Coppice Reference: 1478571 Area(m ²): 33042.19 Type: Plantation on Ancient Woodland	A14SE (NW)	585	9	522679 135621
205	Ancient Woodland Name: Not Supplied Reference: 1478569 Area(m ²): 30478.73 Type: Plantation on Ancient Woodland	A10NE (W)	636	9	522565 135263
206	Ancient Woodland Name: Not Supplied Reference: 1478567 Area(m ²): 32368.43 Type: Ancient and Semi-Natural Woodland	A10NW (W)	726	9	522469 135328
207	Ancient Woodland Name: Not Supplied Reference: 1478086 Area(m ²): 2078.95 Type: Ancient and Semi-Natural Woodland	(NE)	798	9	524321 136358

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
208	Ancient Woodland Name: Not Supplied Reference: 1478097 Area(m ²): 6399.53 Type: Ancient and Semi-Natural Woodland	A7SW (SW)	868	9	522907 134236
209	Ancient Woodland Name: Not Supplied Reference: 1476347 Area(m ²): 93324.01 Type: Ancient and Semi-Natural Woodland	(E)	883	9	524581 134607
210	Ancient Woodland Name: Holmbush Forest Reference: 1478102 Area(m ²): 3317.36 Type: Ancient and Semi-Natural Woodland	A7SW (S)	884	9	523003 134176
211	Ancient Woodland Name: Upper Kilnwood Ghyll Hither Pit Field The Fourt* Reference: 1478093 Area(m ²): 8657.29 Type: Ancient and Semi-Natural Woodland	A14NW (NW)	893	9	522511 135920
212	Ancient Woodland Name: Fullers Shaw Eleven Acres Five Acres Marl Pit Reference: 1478095 Area(m ²): 18512.93 Type: Ancient and Semi-Natural Woodland	A10SW (W)	916	9	522391 134889
213	Ancient Woodland Name: Holmbush Forest Reference: 1478104 Area(m ²): 16205.69 Type: Plantation on Ancient Woodland	A7SW (S)	937	9	523027 134113
214	Ancient Woodland Name: Not Supplied Reference: 1476419 Area(m ²): 8325.88 Type: Ancient and Semi-Natural Woodland	A8SW (SE)	958	9	523826 134020
215	Areas of Outstanding Natural Beauty Name: High Weald Multiple Areas: Y Total Area (m2): 1461737820.66 Designation Date: 30th October 1983 Source: Natural England	A7NE (S)	373	9	523390 134548
216	Nitrate Vulnerable Zones Name: Mole Nvz Description: Surface Water Source: Environment Agency, Head Office	A11NE (NE)	0	10	523303 135063
217	Sites of Special Scientific Interest Name: House Copse Multiple Areas: N Total Area (m2): 124826.67 Source: Natural England Reference: 1002093 Designation Details: Site Of Special Scientific Interest Designation Date: 19th May 1983 Date Type: Notified	A15NW (NW)	363	9	523036 135703
218	Sites of Special Scientific Interest Name: Buchan Hill Ponds Multiple Areas: Y Total Area (m2): 194908.32 Source: Natural England Reference: 1004098 Designation Details: Site Of Special Scientific Interest Designation Date: 20th December 1985 Date Type: Notified Designation Details: Water Framework Directive (WFD) Designation Date: 20th December 1985 Date Type: Notified	(SE)	735	9	524295 134378

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices Horsham District Council - Environmental Health Department Crawley Borough Council - Environmental Health Department	February 2015 January 2015	Annual Rolling Update Annual Rolling Update
Discharge Consents Environment Agency - Southern Region Environment Agency - Thames Region	October 2017 October 2017	Quarterly Quarterly
Enforcement and Prohibition Notices Environment Agency - Southern Region Environment Agency - Thames Region	March 2013 March 2013	As notified As notified
Integrated Pollution Controls Environment Agency - Southern Region Environment Agency - Thames Region	October 2008 October 2008	Variable Variable
Integrated Pollution Prevention And Control Environment Agency - South East Region - Kent & South London Area Environment Agency - South East Region - Solent & South Downs Area Environment Agency - Southern Region Environment Agency - Thames Region	October 2017 October 2017 October 2017 October 2017	Quarterly Quarterly Quarterly Quarterly
Local Authority Integrated Pollution Prevention And Control Horsham District Council - Environmental Health Department Crawley Borough Council - Environmental Health Department	June 2015 March 2015	Variable Variable
Local Authority Pollution Prevention and Controls Horsham District Council - Environmental Health Department Crawley Borough Council - Environmental Health Department	June 2015 March 2015	Annual Rolling Update Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements Horsham District Council - Environmental Health Department Crawley Borough Council - Environmental Health Department	June 2015 March 2015	Variable Variable
Nearest Surface Water Feature Ordnance Survey	September 2017	
Pollution Incidents to Controlled Waters Environment Agency - Southern Region Environment Agency - Thames Region	December 1999 September 1999	Not Applicable Not Applicable
Prosecutions Relating to Authorised Processes Environment Agency - Southern Region Environment Agency - Thames Region	March 2013 March 2013	As notified As notified
Prosecutions Relating to Controlled Waters Environment Agency - Southern Region Environment Agency - Thames Region	March 2013 March 2013	As notified As notified
Registered Radioactive Substances Environment Agency - Southern Region Environment Agency - Thames Region	January 2015 January 2015	
River Quality Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points Environment Agency - Head Office	July 2012	Annually
Substantiated Pollution Incident Register Environment Agency - South East Region - Kent & South London Area Environment Agency - South East Region - Solent & South Downs Area Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	October 2017 October 2017 October 2017 October 2017 October 2017	Quarterly Quarterly Quarterly Quarterly Quarterly

Agency & Hydrological	Version	Update Cycle
Water Abstractions Environment Agency - Southern Region Environment Agency - Thames Region	October 2017 October 2017	Quarterly Quarterly
Water Industry Act Referrals Environment Agency - Southern Region Environment Agency - Thames Region	October 2017 October 2017	Quarterly Quarterly
Groundwater Vulnerability Environment Agency - Head Office	April 2015	Not Applicable
Drift Deposits Environment Agency - Head Office	January 1999	Not Applicable
Bedrock Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified
Superficial Aquifer Designations British Geological Survey - National Geoscience Information Service	August 2015	As notified
Source Protection Zones Environment Agency - Head Office	October 2017	Quarterly
Extreme Flooding from Rivers or Sea without Defences Environment Agency - Head Office	November 2017	Quarterly
Flooding from Rivers or Sea without Defences Environment Agency - Head Office	November 2017	Quarterly
Areas Benefiting from Flood Defences Environment Agency - Head Office	November 2017	Quarterly
Flood Water Storage Areas Environment Agency - Head Office	November 2017	Quarterly
Flood Defences Environment Agency - Head Office	November 2017	Quarterly
OS Water Network Lines Ordnance Survey	October 2017	Quarterly
Surface Water 1 in 30 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 100 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water 1 in 1000 year Flood Extent Environment Agency - Head Office	October 2013	As notified
Surface Water Suitability Environment Agency - Head Office	October 2013	As notified
BGS Groundwater Flooding Susceptibility British Geological Survey - National Geoscience Information Service	May 2013	As notified

Waste	Version	Update Cycle
BGS Recorded Landfill Sites British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites Environment Agency - Head Office	October 2017	Quarterly
Integrated Pollution Control Registered Waste Sites Environment Agency - Southern Region Environment Agency - Thames Region	October 2008 October 2008	Not Applicable Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries) Environment Agency - South East Region - Kent & South London Area Environment Agency - South East Region - Solent & South Downs Area Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	October 2017 October 2017 October 2017 October 2017 October 2017	Quarterly Quarterly Quarterly Quarterly Quarterly
Licensed Waste Management Facilities (Locations) Environment Agency - South East Region - Kent & South London Area Environment Agency - South East Region - Solent & South Downs Area Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	October 2017 October 2017 October 2017 October 2017 October 2017	Quarterly Quarterly Quarterly Quarterly Quarterly
Local Authority Landfill Coverage Crawley Borough Council - Environmental Health Department Horsham District Council - Environmental Health Department West Sussex County Council - Environment & Development	May 2000 May 2000 May 2000	Not Applicable Not Applicable Not Applicable
Local Authority Recorded Landfill Sites Crawley Borough Council - Environmental Health Department Horsham District Council - Environmental Health Department West Sussex County Council - Environment & Development	June 2003 May 2000 May 2000	Not Applicable Not Applicable Not Applicable
Potentially Infilled Land (Non-Water) Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water) Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Transfer Sites Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable
Registered Waste Treatment or Disposal Sites Environment Agency - Southern Region - Solent and South Downs Environment Agency - Southern Region - Sussex Area Environment Agency - Thames Region - South East Area	March 2003 March 2003 March 2003	Not Applicable Not Applicable Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH) Health and Safety Executive	September 2017	Bi-Annually
Explosive Sites Health and Safety Executive	March 2017	Variable
Notification of Installations Handling Hazardous Substances (NIHHS) Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements Horsham District Council - Planning Department Crawley Borough Council West Sussex County Council - Environment & Development	August 2015 February 2016 October 2006	Variable Variable Annual Rolling Update
Planning Hazardous Substance Consents Horsham District Council - Planning Department Crawley Borough Council West Sussex County Council - Environment & Development	August 2015 February 2016 October 2006	Variable Variable Annual Rolling Update
Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015	As notified
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2017	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	As notified
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	June 2015	As notified
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	As notified
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	As notified

Industrial Land Use	Version	Update Cycle
Contemporary Trade Directory Entries Thomson Directories	November 2017	Quarterly
Fuel Station Entries Catalist Ltd - Experian	November 2017	Quarterly
Gas Pipelines National Grid	July 2014	Quarterly
Points of Interest - Commercial Services PointX	December 2017	Quarterly
Points of Interest - Education and Health PointX	December 2017	Quarterly
Points of Interest - Manufacturing and Production PointX	December 2017	Quarterly
Points of Interest - Public Infrastructure PointX	December 2017	Quarterly
Points of Interest - Recreational and Environmental PointX	December 2017	Quarterly
Underground Electrical Cables National Grid	December 2015	Bi-Annually
Sensitive Land Use	Version	Update Cycle
Ancient Woodland Natural England	October 2017	Bi-Annually
Areas of Outstanding Natural Beauty Natural England	August 2017	Bi-Annually
Environmentally Sensitive Areas Natural England	January 2017	
Forest Parks Forestry Commission	April 1997	Not Applicable
Local Nature Reserves Natural England	August 2017	Bi-Annually
Marine Nature Reserves Natural England	August 2017	Bi-Annually
National Nature Reserves Natural England	August 2017	Bi-Annually
National Parks Natural England	August 2017	Bi-Annually
Nitrate Vulnerable Zones Environment Agency - Head Office Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	December 2017 October 2015	Bi-Annually
Ramsar Sites Natural England	August 2017	Bi-Annually
Sites of Special Scientific Interest Natural England	August 2017	Bi-Annually
Special Areas of Conservation Natural England	August 2017	Bi-Annually
Special Protection Areas Natural England	August 2017	Bi-Annually

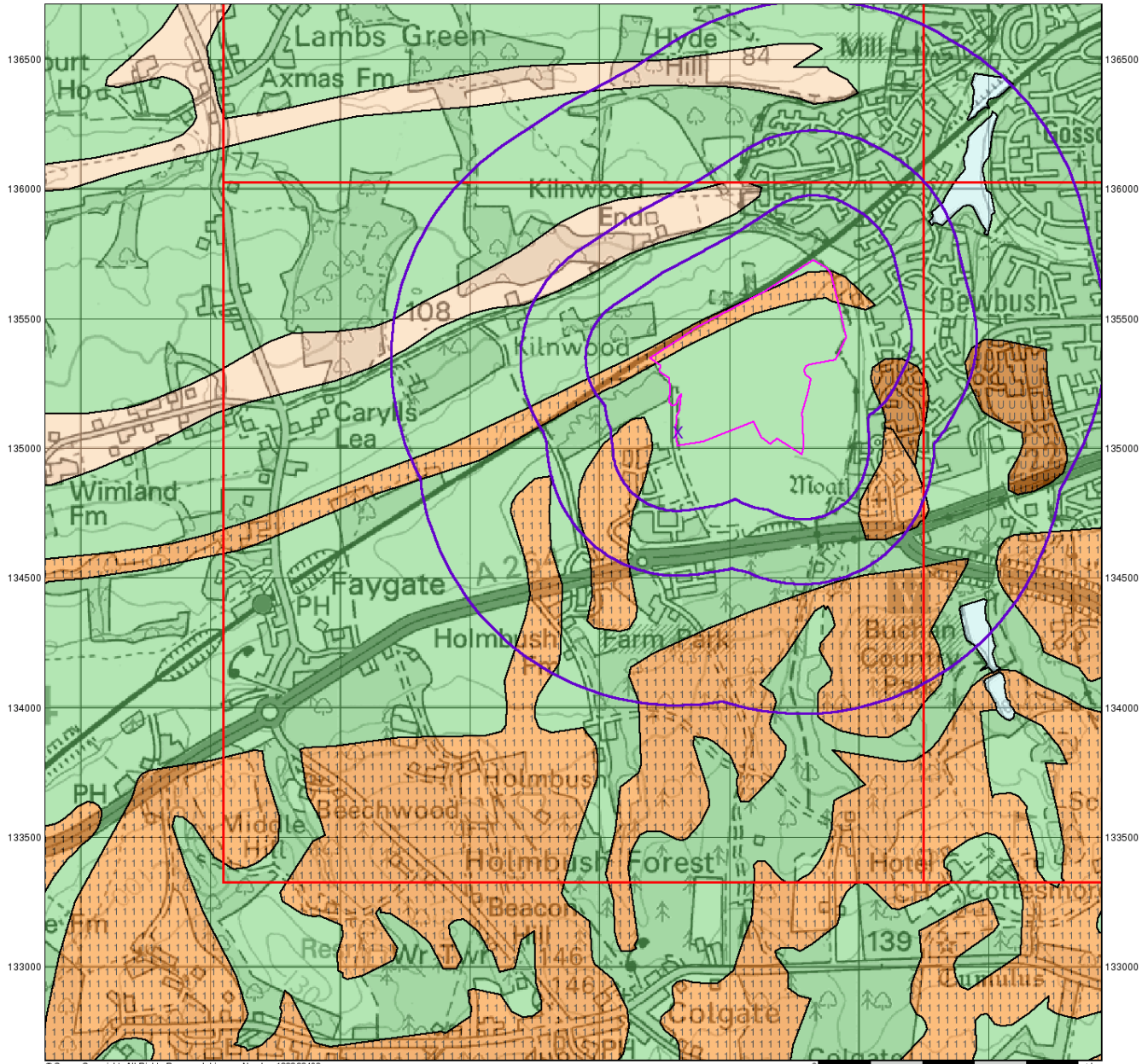
A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	 <p>British Geological Survey NATURAL ENVIRONMENT RESEARCH COUNCIL</p>
Centre for Ecology and Hydrology	 <p>Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL</p>
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Contact	Name and Address	Contact Details
1	British Geological Survey - Enquiry Service British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	Environment Agency - National Customer Contact Centre (NCCC) PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	Horsham District Council - Environmental Health Department Park House, North Street, Horsham, Sussex, RH12 1RL	Telephone: 01403 215100 Fax: 01403 732790 Website: www.horsham.gov.uk
4	Ordnance Survey Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
5	West Sussex County Council - Environment & Development County Hall, Tower hall, Chichester, West Sussex, PO19 1RH	Telephone: 01243 777100 Website: www.westsussex.gov.uk
6	Crawley Borough Council - Environmental Health Department Town Hall, The Boulevard, Crawley, Sussex, RH10 1UZ	Telephone: 01293 438534 Fax: 01293 511803 Website: www.crawley.gov.uk
7	Peter Brett Associates Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN	Telephone: 0118 950 0761 Fax: 0118 959 7498 Email: reading@pba.co.uk Website: www.pba.co.uk
8	PointX 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
9	Natural England County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk
10	Environment Agency - Head Office Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
-	Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	Landmark Information Group Limited Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

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Groundwater Vulnerability

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

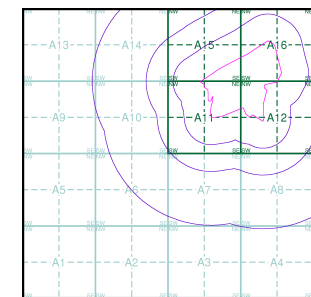
Agency and Hydrological

Geological Classes

- Major Aquifer (Highly Permeable)**
 - High (H) 1, 2, 3, U
 - Intermediate (I) 1, 2
 - Low
- Minor Aquifer (Variably Permeable)**
 - High (H) 1, 2, 3, U
 - Intermediate (I) 1, 2
 - Low
- Non Aquifer (Negligibly Permeable)**
 -
- Water or Sea**
 -
- Drift Deposit**
 -

Soil Classes

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

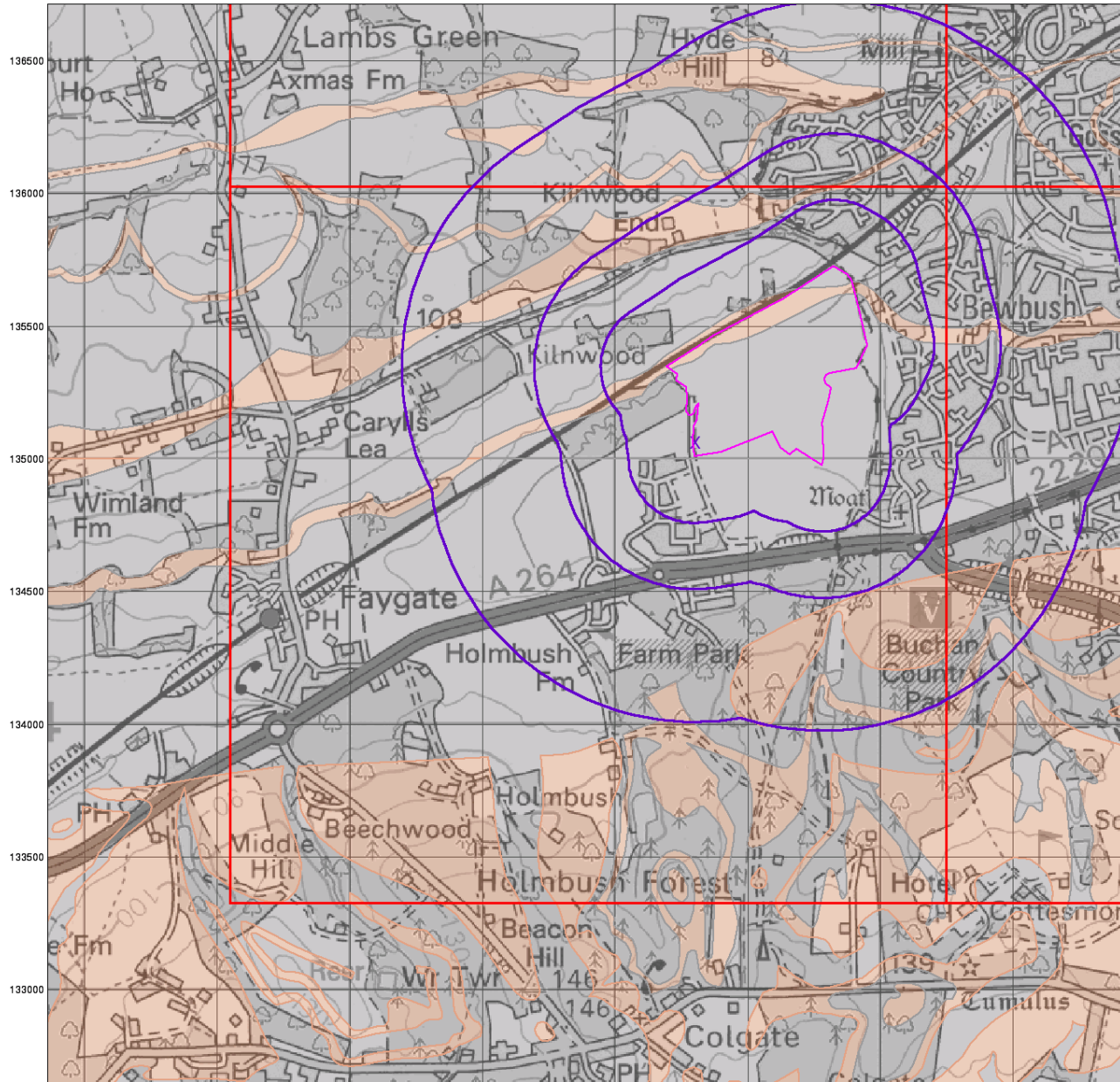
Site Details

Site at 523573, 135351



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Bedrock Aquifer Designation

General

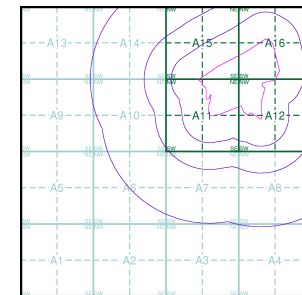
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

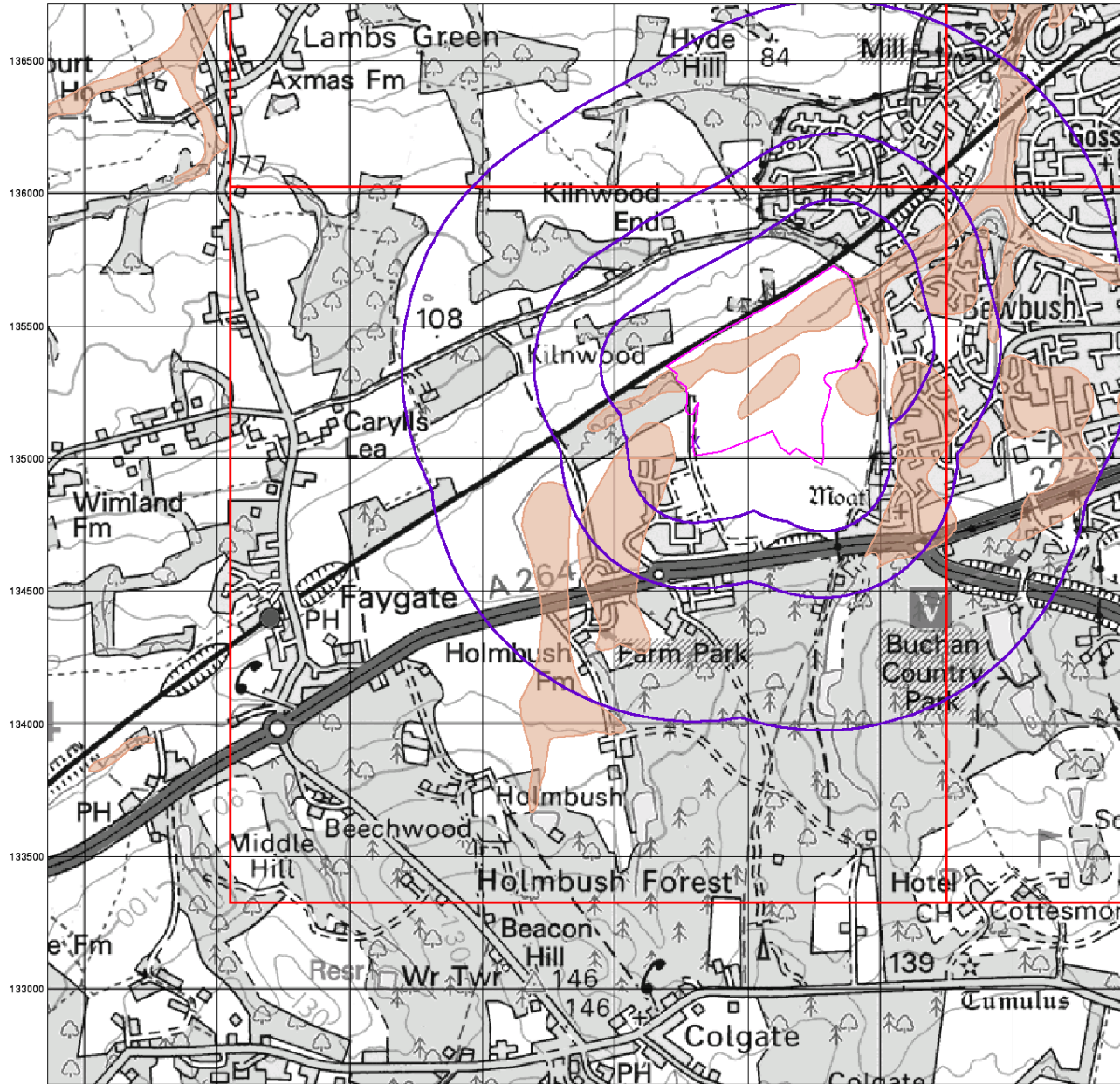
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Superficial Aquifer Designation

General

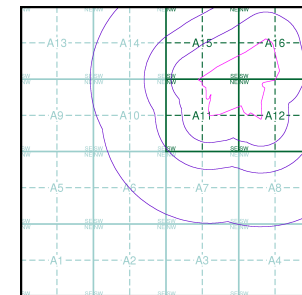
- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

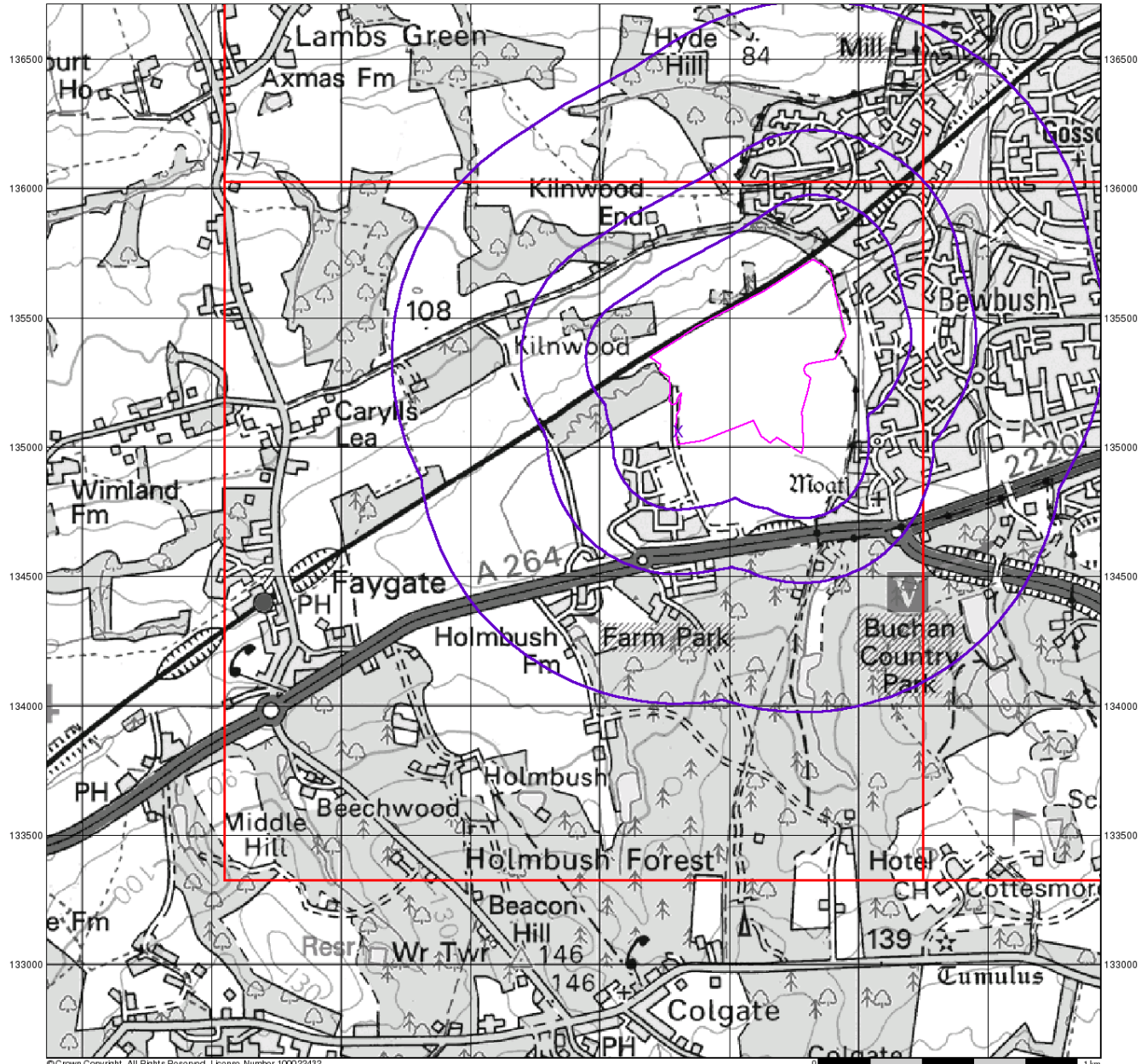
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Source Protection Zones

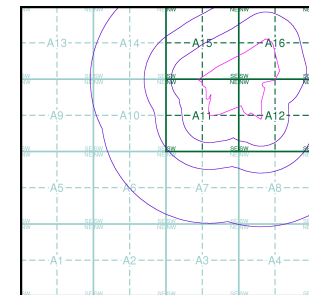
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)
- Source Protection Zone Borehole

Site Sensitivity Context Map - Slice A



Order Details

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 Site Area (Ha): 31.68
 Search Buffer (m): 1000

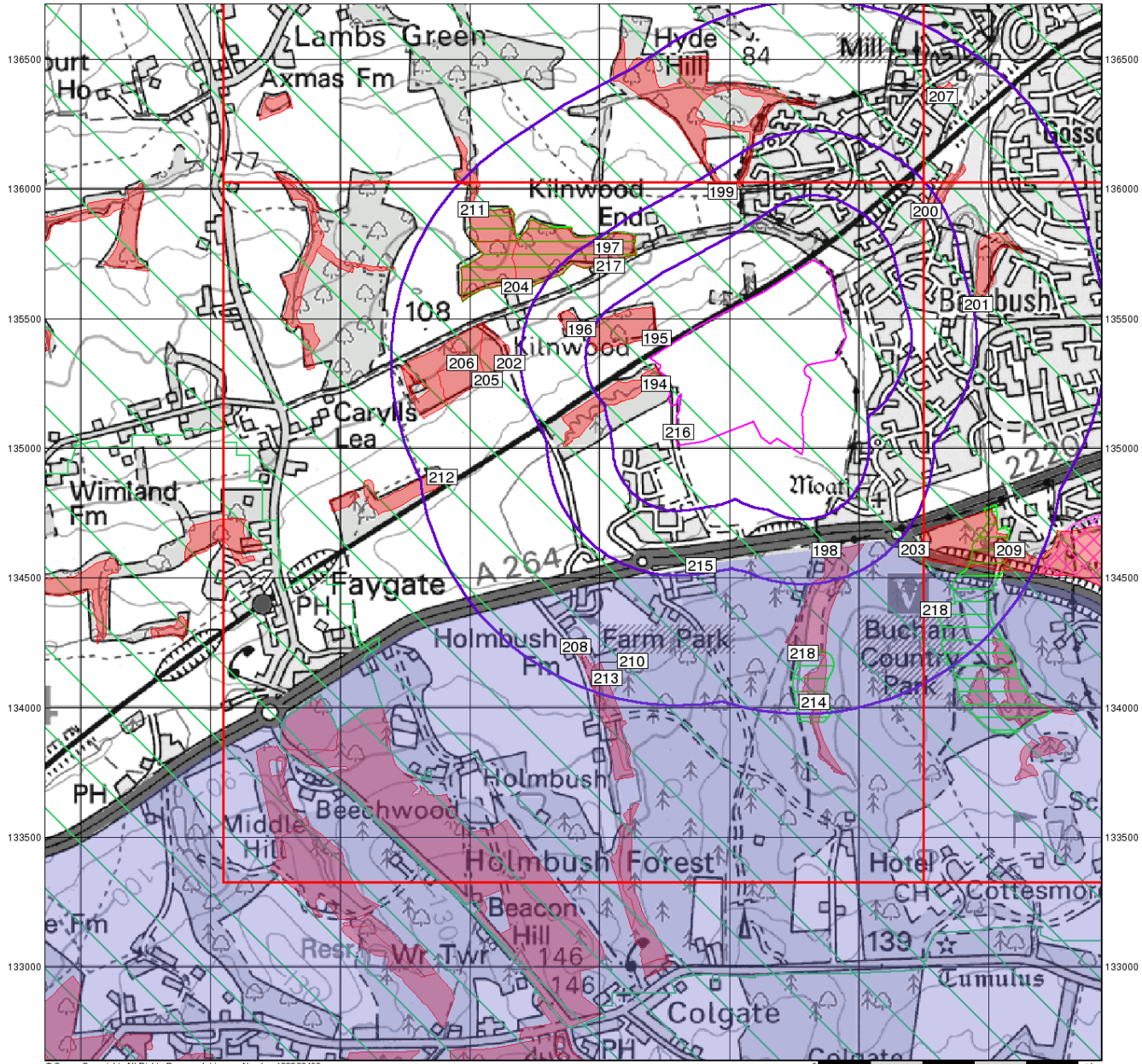
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Sensitive Land Uses

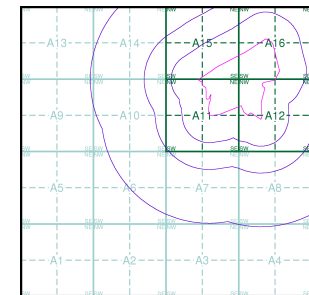
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice
- Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



Order Details

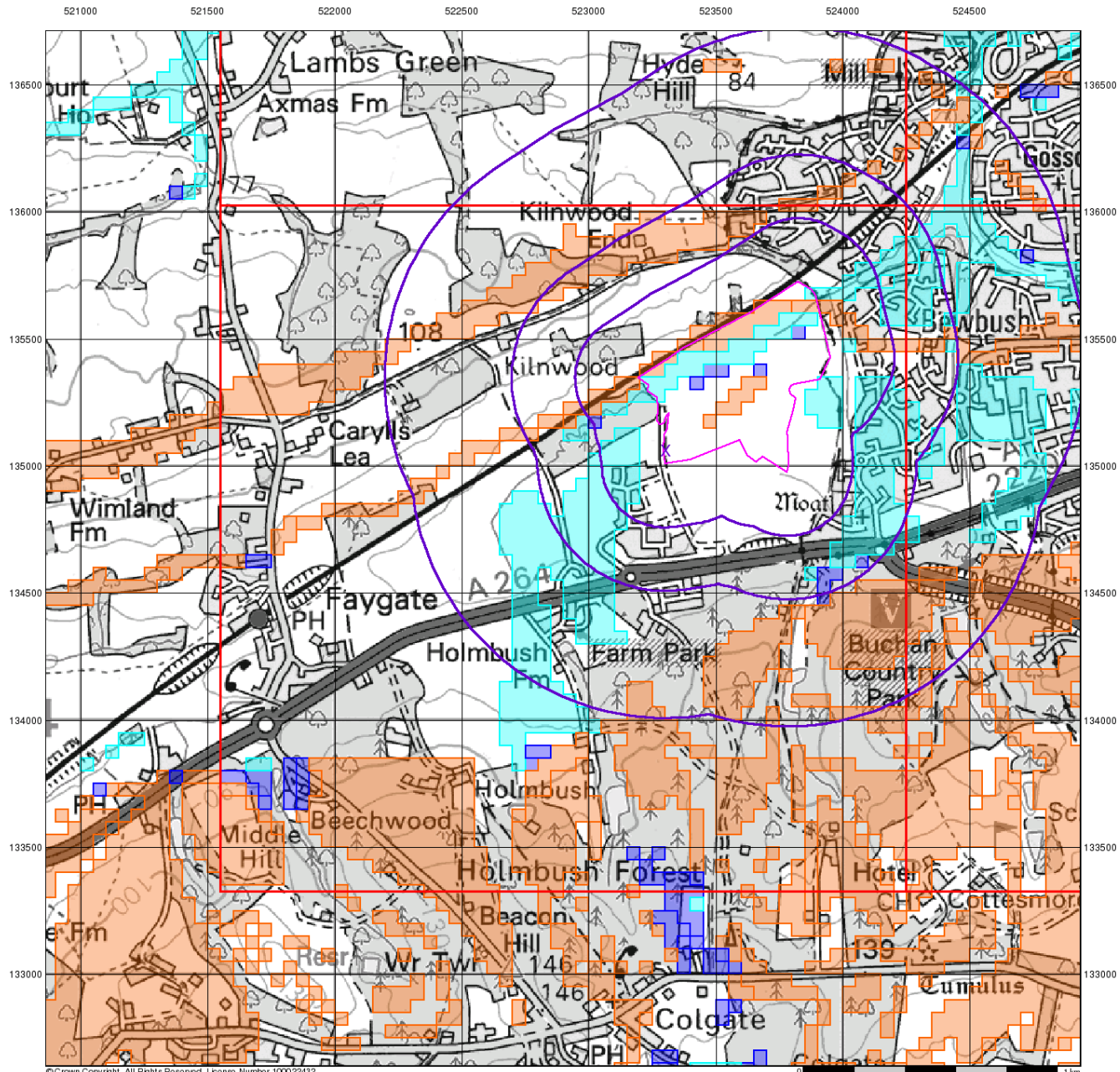
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 Customer Ref: 66444
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 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

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BGS Flood GFS Data

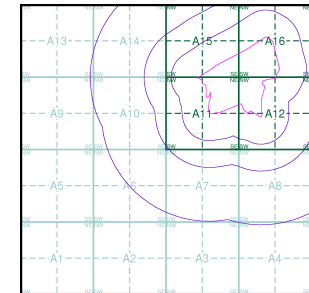
General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number: 155682781_1_1
 Customer Ref: 66444
 National Grid Reference: 523300, 135060
 Slice: A
 Site Area (Ha): 31.68
 Search Buffer (m): 1000

Site Details

Site at 523573, 135351



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 Web: www.envirocheck.co.uk